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RICHARD H. HUTCHINGS, M. D., Editor
CLARENCE O. CHENEY, M. D., Associate Editor
NEWTON J. T. BIGELOW, M. D., Associate Editor
GEORGE L. CANTZLAAR, A. B., Editorial Assistant

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TABLE OF CONTENTS

	PAGE
Electroencephalography. By Frederick Lemere, M. A., M. D.	5
The Therapeutic Promise of Foster Family Care for the Mentally Ill. By Newton J. T. Bigelow, M. D., and Eva M. Schied, R. N.	16
Thyroid Therapy in a Series of Epileptics. By Glenn J. Doolittle, M. D.	33
The Involutional (Mental) Syndrome. By G. M. Davidson, M. D.	42
Pellagra: Report of Two Cases in Psychotic Patients. By Alma Freeman, M. D.	83
Prostigmin Treatment of Myasthenia Gravis. By F. M. Miller, Jr., M. D., and Harold H. Dodds, M. D.	90
The Technique of the Insulin Shock and Metrazol Treatments. By L. Laramour Bryan, M. D.	96
Results of Metrazol Therapy in Schizophrenia. By Nathan Beckenstein, M. D.	106
Insulin and Metrazol Therapy in Identical Twins. By James M. Murphy, M. D., and Henry Luidens, M. D.	114
Subsequent Course in a Series of Fifty-five Insulin-Treated Patients. By David Ruslander, M. D.	123
Treatment of Schizophrenia with Sympathomimetic Drugs: Benzedrine Sulfate. By Eugene Davidoff, M. D., and Edward C. Reifenstein, Jr., M. D.	127
Literacy and Mental Disease. By Benjamin Malzberg, Ph.D.	145
A Comparative Study of Psychoses Among Negroes and Whites in the New York State Prisons. By Samuel C. Karlan, M. D.	160
Are Mental Diseases on the Increase? By Henry B. Elkind, M. D.	165
Excerpts: By Joseph Zubin, Ph.D.	173
By Abraham Myerson, M. D.	177
Book Reviews	183
Notes	198

ELECTROENCEPHALOGRAPHY*

BY FREDERICK LEMERE, M. A., M. D.

Electroencephalography is comparable to electrocardiography except that the record of the electrical activity of the brain is much more complicated than that of the heart. As Adrian[1] has said, it is as though there were many hearts beating simultaneously within the cranial cavity. Certain groups of neurons seem to unite under certain favorable conditions and beat synchronously at a rate and rhythm characteristic for the particular group of cells involved. The electrical pulsations of some of the cortical neuron groups on the upper surface of the brain may be observed by placing electrodes against the scalp, amplifying the impulses and recording them by means of an oscillograph.

Records so obtained show three main types of waves. The first, most outstanding and best understood rhythm is that composed of Berger's[2] alpha waves which arise predominantly from the visual cortex of the occipital lobe.[3] The alpha rhythm has a rate of from 8 to 12 beats per second and the waves attain a voltage of around 50 millionths of a volt. They usually appear only with the eyes closed and the subject at rest. If the eyes are opened and the subject looks at an object, or if he is anxious or emotionally stimulated, or if he engages in strenuous mental activity, the alpha rhythm tends to disappear. The amount of alpha wave activity present in any one subject seems to be constant from one day to the next.[4, 5] The amount of alpha rhythm produced by different individuals, however, varies a great deal. Some have almost no alpha rhythm, others have an almost continuous alpha activity, and there are all gradations between the two (Fig. 1).

The second type of wave, the beta, has a fast rhythm of from 15 to 60 beats per second and a voltage of around 5 to 10 millionths of a volt. These waves are little understood. They are present with the eyes open or shut and appear to arise predominantly from the frontoparietal cortex of the brain.[6]

The third type of wave, the delta, occurs at an irregular 1 to 5 per second rate and at varying voltages from 20 to 100 or 200 mil-

*This investigation was carried out at the Eastern State Hospital, Medical Lake, Wash., and the National Hospital, Queen Square, London. It was financed by a grant from the Committee on Scientific Research of the American Medical Association and a grant from the Rockefeller Foundation.

lionths of a volt. Delta waves are normally present only during sleep[7] or early childhood[8, 9] but they occasionally occur in the "awake adult" record. In general, however, delta waves indicate some physiological or pathological depression of the cortex as during infancy, sleep, general anesthesia, or a lowering of the level of consciousness due to toxic or organic factors.[10] Delta waves are present with the eyes open or shut and they seem to displace the alpha rhythm.

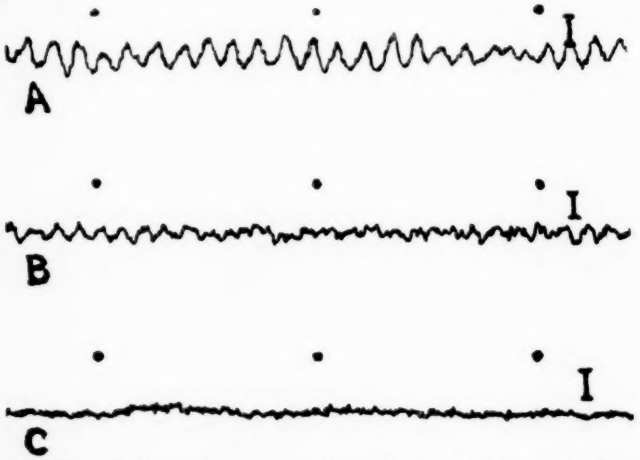

Fig. 1. Record from three normal controls, showing variations in amount of alpha wave activity between individuals. (A) Strong alpha activity. (B) Alpha activity of medium strength. (C) No alpha activity. In this and subsequent records, the dot time markers equal one second in time, and the vertical scale at the side equals 50 millionths of a volt of potential. The records are read from left to right.

With these normal electroencephalographic findings in mind it was thought that it might be interesting to study the brain wave patterns in the various neuropsychiatric disorders and compare these with the findings of other investigators.

Material and Methods

Electroencephalograms have been obtained from 100 normal individuals and 150 neuropsychiatric patients. In nearly all of these cases, records were obtained on at least three different occasions. This was important because in psychotic patients especially there

is a much wider variation from day to day than in normal individuals.

Only cooperative patients were examined in order to eliminate any artefacts that might have arisen from uncontrolled mental or physical activity. The records were always obtained under standard conditions, the patient lying recumbent with the eyes shut, and with no extraneous disturbances. None of the subjects studied was receiving drugs. Only patients with fairly clear cut diagnoses were used in this investigation.

Results

Toxic-Organic Reactions. Any severe depression of the cortex resulting in a clouded sensorium or intellectual deterioration was accompanied by slow, irregular 1-5/sec. delta waves. Delta waves were most noticeable in severe toxic psychoses, increased intracranial pressure, posttraumatic syndromes (Fig. 2), mental deficiency below a mental age of about five years,[11] encephalitis, meningitis, and in deteriorated schizophrenic, manic-depressive, alcoholic, heredo-degenerative, cerebral arteriosclerotic, senile, or epileptic patients.[12, 13, 14] The alpha rhythm was nearly always depressed in those conditions in which delta wave activity was prominent.

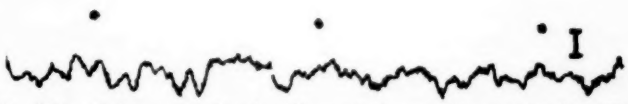

Fig. 2. Record from a patient with a posttraumatic psychosis. Shows the slow 1-5/sec. delta waves seen in severe toxic or organic depression of the cerebral cortex

Epilepsy. In epilepsy the slow, irregular 1-5/sec. delta waves are often found especially in deteriorated cases. These delta waves may be localized in isolated areas of the cortex or they may be generalized over the whole cortex.[15]

Gibbs, Gibbs and Lennox[16] have described characteristic outbreaks of smooth slow 3/sec. waves usually alternating with spiked waves during petit mal attacks. These waves often occur subclinically without any external evidence of an attack in what they have termed a "larval" seizure (Fig. 3). Similar but much faster

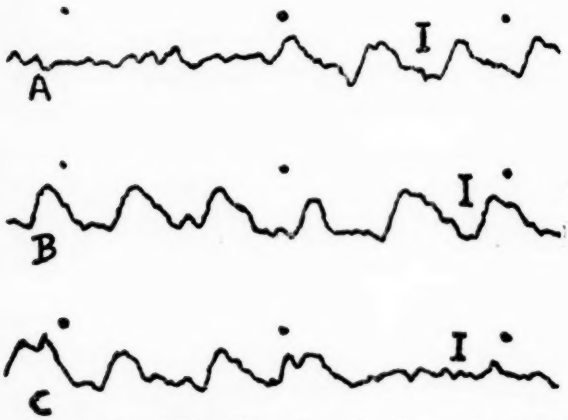

Fig. 3. Record of a "larval" petit mal seizure. A, B and C are continuous. Slow 3/sec. smooth waves with tendency to spike formation between each slow wave.

waves are usually seen in grand mal cases (Fig. 4). Sharp spikes of potential are also seen in epileptic records, especially in Jacksonian cases where they appear to emanate from the discharging focus.[17]

Brain Tumors. Walter[18] and Case[19] have shown that delta waves may emanate from the depressed cortex surrounding a cerebral tumor or abscess and therefore may be of some localizing value. The lesion must be superficial in the upper accessible surface of the brain in order to produce changes in the electroencephalogram and generalized cortical depression such as produced by intracranial pressure must be eliminated.

Paresis. As Berger[2] has shown, the alpha waves in acute paretics are almost pathognomonically irregular in rate (Fig. 5). After malaria the alpha waves become much more regular.

So-called Functional Psychoses. The records from schizophrenic patients appeared to be normal, except that there is a greater tendency to delta wave activity especially in malignant and deteriorated cases than in normal controls. A special, and I think a very important, characteristic of the schizophrenic records is the relative paucity of alpha wave activity[20] (Fig. 6). This observation has been confirmed by many investigators.[12, 21, 22, 23]

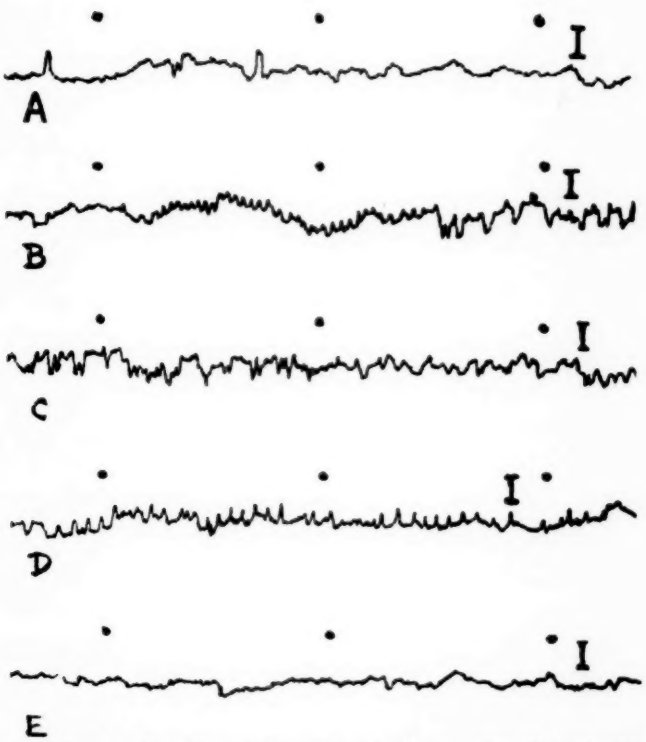

Fig. 4. Record of a "larval" grand mal seizure. No clinical evidence of a convulsion. A, B, C, D and E are continuous. (A) Just before onset of "larval" spell, showing two small spikes of positive potential. These spikes may occur alone, especially in Jacksonian cases. (B) Tonic waves becoming clonic. (C) Clonic phase, showing characteristic slow and fast spiked waves. (D) End of "larval" seizure. (E) Postseizure depression of waves due to cortical fatigue.

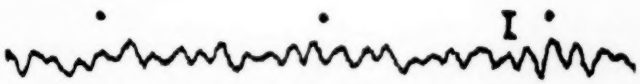

Fig. 5. Record from acute paretic. The alpha waves are characteristically irregular in length (8-11/sec.)

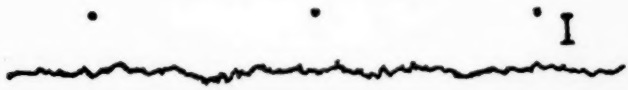

Fig. 6. Record from a schizophrenic patient. No alpha (10/sec.) but some delta (1-5/sec.) waves

Manic-depressive cases in either phase of the illness show a definite tendency to a stronger alpha rhythm than the normal controls (Fig. 7). This is especially noteworthy in the milder cases. Delta waves were also seen in some of the more severe cases.

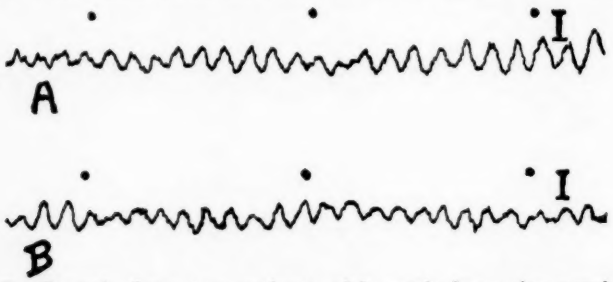

Fig. 7. Records from two patients with manic-depressive psychoses. (A) Manic patient. (B) Depressed patient. Note strong alpha rhythm

The presenile and involutional cases, which seldom show much alpha wave activity, were obviously not included in this group of so-called functional psychoses.

Discussion

As yet, the diagnostic accomplishments of this new method of psychiatric investigation do not seem particularly impressive. The electroencephalographic findings are nonspecific for the most part and usually show pathological changes only when the clinical diagnosis is already obvious. For example, mental deficiency shows pathological activity in the brain wave pattern only when the mental age is five years or below. The serological tests in paresis detract from the practical use of the electroencephalogram in this condition. The actual use of the electroencephalogram in diagnosing and localizing brain tumors is made difficult because any type of lesion in the cortex may produce delta waves identical with those found in brain tumor and such waves have even been observed in normal controls.

The chief clinical value of the electroencephalogram has been in epilepsy where characteristic "larval" seizures are found. Even in clinically indisputable cases of this disorder, however, records may have to be run over hours or even days to catch any abnormal tracing. Golla, Graham and Walter[15] found abnormal waves in

only 91 out of 214 epileptic patients examined in a mental hospital by a single recording.

The apparently normal appearance of records obtained from schizophrenic and manic-depressive patients has been disappointing. Hoagland, Rubin and Cameron,[24] however, feel that the amount of delta wave activity (delta index) present in a schizophrenic record is a rough measure of the severity of the illness and that a relapse can occasionally be foretold by the reappearance of the delta waves. They also believe that the delta index may be used to follow insulin hypoglycemia and that it may be of some help in gauging the depth of the shock. My own experience agrees with theirs for the most part but technical limitation will probably prevent any general use of the electroencephalograph for this purpose.

The major contribution of the electroencephalograph will probably be the added light that it throws on the physiopathology of the psychoses rather than its direct use as a diagnostic agent. The confirmed observation that the alpha rhythm is relatively weak in schizophrenia seems to me to be especially significant. It is generally agreed that the type of record produced by any one individual depends on a more or less inherent neurophysiological characteristic that is constitutionally determined. The weak alpha rhythm found in schizophrenia would seem to express, therefore, a constitutional but not necessarily abnormal tendency that might well be the predisposing groundwork on which the psychosis develops, provided the precipitating factors are sufficiently powerful, or the constitutional tendency sufficiently malignant. That the weak alpha rhythm is constitutionally determined is indicated by the fact that it persists after a spontaneous or shock-produced remission and is apparent in schizoid personalities.[25]

The exact significance of the constitutionally weak alpha rhythm in schizophrenia is somewhat obscure but the author has developed a theory which might merit brief consideration. Adrian[3] has shown that the alpha rhythm is produced by a group of neurons, at least one centimeter in diameter, beating synchronously. Theoretically the greater the synchrony between the cortical neurons the stronger the alpha rhythm.

Gerard[26] and Jasper[27] have shown that there is a certain optimum level of excitation or activation in the cortex above which, or below which, neuron synchronization and wave production becomes weaker. The neuronal asynchronization that is responsible for the weak alpha rhythm in schizophrenia is due, the writer is convinced, to a low-excitation cortex because stimulating factors temporarily strengthen the alpha rhythm. The excitement surrounding the initial recording or other emotionally stimulating situations are often associated with a temporarily strengthened alpha rhythm in schizophrenic patients. Direct cortical excitation resulting from anoxemia produced by carbon dioxide inhalation, prenarcotic doses of intravenous sodium amytal, or insulin or metrazol, are also associated with a temporary strengthening of the alpha rhythm.[25]

With these facts in mind I have postulated a hypotonic, or low energy or low-excitation cortex as the neurophysiological defect in schizophrenia responsible for the weak alpha rhythm seen in this disorder. This in turn I believe is dependent upon an even more fundamental diencephalic weakness in sending tonus impulses to the cortex. Spiegel[28] and this author have both observed that unilateral lesions interrupting the pathways between the diencephalon and the cortex have produced a weak alpha rhythm on the affected side. This, together with the work of Ingram, Barris and Ranson,*[29] and the general impression that affect, attention, and the level of consciousness are intimately related through the interrelationships of the diencephalon and the cortex,[30] are sufficient, in my opinion, to incriminate the diencephalon as the primary deficiency in schizophrenia. Therefore, I would like to suggest that the physiopathology of schizophrenia is a constitutional defect in diencephalic energy production, especially as it relates to the transmission of tonus impulses to the cortex.

As is to be expected, there is not a complete agreement between the physiological factor of a weak alpha rhythm and the clinical diagnosis, as is shown by the table. The paranoid type of schizophrenia shows this tendency towards a weak alpha rhythm to a lesser extent than the other types and it is precisely this type of case that may show a strong affect with a great deal of feeling and sustained psychic energy. The cold apathetic type of schizophrenic pa-

*In which they produced schizophrenic-like states in animals with apathy and even catatonia by bilateral diencephalic lesions.

TABLE SHOWING THE RELATIVE AMOUNT OF ALPHA RHYTHM PRESENT IN THE DIFFERENT PSYCHIATRIC REACTION TYPES AS COMPARED TO ONE HUNDRED NORMAL CONTROLS

Clinical diagnosis	Number of cases	Amount of alpha rhythm: Strong, per cent	Medium, per cent	Weak, per cent
1. Epilepsy	22	0	64	36
2. Schizophrenic reactions:				
Catatonic	18	6	11	83
Hebephrenic	11	9	18	73
Paranoid	21	23	29	48
3. Mixed manic-depressive schizophrenic reactions	13	38	31	31
4. Depressive reactions	19	53	11	36
5. Manic reactions	12	42	25	33
6. Paresis	15	0	26	74
7. Senile, presenile and involutional cases	16	13	19	68
8. Normal controls	100	28	38	34

tient with poorly sustained affect is, in my experience, the one with the poorest alpha rhythm. Thus, as I have pointed out before,[20] the amount of affect available, that is, the potential diencephalic energy, seems to be the characteristic personality feature that correlates most closely with the alpha rhythm strength.

The situation in the manic-depressive psychoses is not as clear because theoretically too much affect with cortical overstimulation might lead to a Wedensky type of cortical blocking with a weak alpha rhythm. A weak alpha rhythm is found in many manic-depressive cases (see table) but here rest and quiet seem to bring out the alpha rhythm rather than stimulating situations as in schizophrenia. In contrast with schizophrenic patients, the first recording usually shows the poorest rhythm when contrasted to subsequent less disturbing recordings. At any rate, according to my theory, the physiopathology of the manic-depressive psychoses would be a hyperactive diencephalon sending excessive tonus impulses to the cortex with a resulting hypertonic cortex. Again it must be emphasized that clinical diagnoses cannot be expected to correlate too exactly with the electroencephalographic findings, which depend on neurophysiological processes. The warm, friendly, cooperative type of individual with sustained affective and psychic

energy is, in my experience, the one most likely to have a strong alpha rhythm.

Summary and Conclusions

1. The clinical possibilities of electroencephalography have yet to be developed except in certain cases of epilepsy where it already is of some diagnostic and localizing assistance. The changes in brain tumor or abscess are nonspecific but of some possible localizing value provided a tumor has already been diagnosed. The changes in the electroencephalogram in paresis, mental deficiency, posttraumatic syndromes, or any other organic cerebral involvement seem to be present only after the damage is so severe as to be obvious clinically.

2. The use of electroencephalography as an instrument of neurophysiological investigation has tremendous potentialities. The added light that it has thrown on the physiopathology of epilepsy will undoubtedly lead to improved treatment in this condition. A new approach to the problem of the so-called functional psychoses has been opened up and a theory as to the physiopathology of schizophrenia and the manic-depressive psychoses is advanced on the basis of established electroencephalographic findings.

3. Electroencephalography will probably be of greater value as a research agent than as a direct diagnostic instrument.

706 Medical and Dental Building,
Seattle, Wash.

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THE THERAPEUTIC PROMISE OF FOSTER FAMILY CARE FOR THE MENTALLY ILL

Some Observations on Technique, Results Obtained, and Potentialities, with Brief Case Summaries

BY NEWTON J. T. BIGELOW, M. D., AND EVA M. SCHIED, R. N.

The following is an attempt to evaluate boarding home placement from the therapeutic, psychological, administrative and sociological viewpoints. It is based upon more than two years experience working with a State hospital population of about two thousand patients, of whom 281 were on the usual parole status and 56 were residing in boarding homes on April 1, 1938. Although the project has continued to expand, it was thought well not to include too recent placements in this study. It is our considered opinion that with redoubled effort, adequate personnel and ample funds this combined extramural group could not be made to exceed 500, despite Pollock's[1] estimate to the contrary. This statement is gladly held open to future revision, but is made on the basis that the supply of suitable patients would probably be exhausted at that figure.

In general our patient population, which is mixed racially and culturally, conforms to the average diagnostic distribution, although the percentage of patients admitted at an advanced age is large. During the fiscal year ended June 30, 1936, of 403 admissions, 189 were over 50 years and 72 over 70 years of age. Corresponding figures for the following year were respectively 477, 233 and 81. The hospital district is mainly rural, with several industrial centers, and extends over four counties and portions of two others. However, our work has been facilitated by the residence of a hospital social worker in two of the outlying counties and well-established clinics in all of them. To date we have been unable to establish community centers for family care. Under the circumstances the need does not seem pressing, nor are we convinced of the benefits which might accrue to our group.

Procedure

Recommended patients for whom no other exit from the hospital is available are considered in detail at the usual parole conferences. If approved, placement is broached to the patient and his family, and when a vacancy exists in a suitable home definite arrangements are completed. It should be stated that in every case repeated attempts at parole had failed. This is one point at which the therapeutic value of boarding home placement is obvious. A substantial number of patients' families present, over and above economic barriers, psychological or social contraindications to the return of the patient to that milieu. However, a temporary sojourn in foster care frequently modifies the attitude of both the patient and his family and neighbors so that later parole status is desired. Each placement is an individual, protracted problem, and the patient's religious affiliation, racial extraction, work and avocations if possible, receive consideration. The responsible relative has approved with alacrity in all but few cases, and care is taken to arouse the patient's enthusiasm. Twelve moderately suitable patients have obdurately refused to leave the hospital, in contrast to the generally quoted belief that all prefer "home life in a hovel to institutional life in a palatial hospital." It cannot be emphasized too strongly that case work methods must be practised with the patient, his relatives and the family which receives him. In the experience of the writers, the conservative, unhurried selection and placement advocated by Vaux[2] has obviated untoward events.

Unsolocited applications from prospective homes have been numerous, following the first placements. All have been inspected, and, considering the initial boarding rate, few have been rejected. It is obvious that the foster home should not excel that from which the patient came and to which he may return.[3] The suitability of a prospective home from a physical standpoint should be matched by the collective personality of the foster family, having in mind therapeutic implications.[4] Only observation and trial sometimes will determine this factor. Rural homes numbered five, village homes seven and urban 15 in this project. For the former $4 a week and and for the latter two, $5 is paid. Spending money has not been

provided by the hospital, the patient being encouraged to earn such. The genuine interest of the foster families in their charges, referred to frequently,[5] has been confirmed.

Analysis of Placements

During the period December 26, 1935 to March 31, 1938, 48 males and 65 females, a total of 113 patients, were placed in boarding homes. Of these, 11 males and 9 females have been discharged, classified as follows: 7 self-sustaining, 5 receiving old age assistance, 2 subsisting upon their own funds, 1 supported by public funds in his own community. Five have died. It has seemed advantageous to reestablish patients eligible for later old age assistance in their place of legal settlement.

This discharged group of 20 patients had previously received State hospital care for a total period of over 130 years, an average of more than six years per patient. The total time in family care amounted to over sixteen years, an average of 10 months per patient. Diagnostically they were distributed in the following classifications: manic-depressive psychosis 5, dementia præcox and senile psychosis 4 each, psychosis with syphilitic meningoencephalitis 2, and 1 each of involutional melancholia, psychosis with cerebral arteriosclerosis, alcoholic deterioration, psychosis with other somatic disease, and psychosis with mental deficiency.

The age at placement ranged from 25 to 83 years, the average age being 61 years. Seventeen were of American birth; 4 were married, 9 single, 5 widowed and 2 separated. Three had received high school education, 1 college training, 2 were illiterate and the remainder had had varying degrees of common school education. Thus age, mental diagnosis, civil status, religious affiliation, cultural background, and duration of hospitalization, all-important factors in placement, do not appear to be determinants of success. However, underlying personality and achievement of economic security seem to be large factors for success.

Fifteen individuals, a group consisting of 5 males and 10 females, have advanced to parole status, after a total period of State hospital care of about 76 years, the average being slightly more than 5 years. The total period of foster family care was approximately 12 years, an average duration of slightly less than one year. Diag-

noses included: dementia præcox 5; 2 each of manic-depressive psychosis, psychoneurosis and senile psychosis; 1 each of psychosis with psychopathic personality, alcoholic psychosis, psychosis with syphilitic meningoencephalitis and psychosis with mental deficiency. Ages ranged from 30 to 81 years, averaging 50 years. All were American born. Ten were single, 2 married, 2 widowed and 1 separated. Educational advantages correspond with those of the discharged group. All are making a good adjustment. Eight are self-supporting, one is receiving old-age assistance, another is supported by a department of public welfare, one is cared for through a board of child welfare, and four are paroled to their own relatives.

We should expect to gain some enlightenment from our failures. Analysis of the returns to the hospital necessitated in the cases of 22 patients after thorough trial of foster family care (in several cases three attempts) yields the following facts:

This group of 12 males and 10 females had received a total period of State hospital care amounting to about 193 years, or an average duration exceeding 7 years. Their residence in foster family care totalled approximately 8 years, an average of 4 months per patient.

In comparing the duration of hospitalization in these three groups it should be noted that we are now placing patients in family care within eight weeks after admission. The therapeutic value of such a procedure for the group which tends to become institutionalized is obvious.

Diagnostically these returns are classified as follows: psychosis with cerebral arteriosclerosis 6, psychosis with psychopathic personality and manic-depressive psychosis each 5, dementia præcox 4, and 1 each of psychosis with mental deficiency and senile psychosis. The age span was from 18 to 78 years, an average of 49; all but 2 were of American birth; 11 were single, 5 married, 4 widowed and 2 separated; educational advantages were not dissimilar to those in the other groups. It is interesting to note that at the present time 12 of these patients are residing on closed wards. The diagnostic grouping also deserves attention in that psychosis with cerebral arteriosclerosis, with psychopathic personality and manic-depressive psychosis headed the list. It is only

fair to state that five individuals were returned on account of physical illness or injury. Likewise it should be said that but five patients violated restrictions imposed at the time of their placement and that violations occurred only among these returned patients. Finally we plan to try further placements in 10 of these cases, with preference for patients who have received insulin therapy or who have recovered from physical illness. Complete failure then is acknowledged in 12, although in retrospect one feels that the attempt was justified in each instance.

There remains the group of 56, consisting of 20 male and 36 female patients, in family care at the time of writing. They had had hospital residence totaling 457 years, an average of more than eight years per patient. Diagnostically they are clasified as follows: dementia præcox 17, manic-depressive psychosis and psychosis with syphilitic meningoencephalitis 7 each, epileptic psychosis 4, senile psychosis and psychosis with psychopathic personality 3 each, and 2 each of psychosis with cerebral arteriosclerosis, psychoneurosis, psychosis with mental deficiency, alcoholic psychosis, psychosis with epidemic encephalitis, undiagnosed psychosis and paranoid condition. (Parenthetically it may be remarked that the last two had each resided continuously in the hospital 34 years.) The list is completed by one case of involutional melancholia. At the time foster home care was instituted, ages ranged from 19 to 72 years, the average being 52. All but 3 were of American birth; 25 were single, 13 married, 10 widowed, 5 divorced and 3 separated; in educational advantages they did not vary from the other groups. Except for seven of them, the prognosis for continued community adjustment seems good.

Illustrative Material

The following cases demonstrate some of the values of foster family care.

Case 1. After almost continuous residence in private and State hospitals since 1898, a single woman aged 68 was placed in domestic service in an institution, May 19, 1926. She presents a typical psychopathic personality wth periodic excitement and depression. Because of increasing enfeeblement and the economic depression she lost her employment, returned to the hospital for about two

years and was placed in foster family care, June 30, 1935. Her subsequent adjustment has been good. Psychologically she has been benefited by her independence from hospital life and by acceptance as one of a family. Placement seems to have satisfied a craving thwarted since 1898 when she was first institutionalized.

Case 2. A 55-year-old electrical engineer, both of whose parents were psychotic, developed a florid schizophrenic reaction after a successful and lucrative career. He was hospitalized four months in 1929 and returned to the hospital, August 28, 1935. Although frankly delusional and hallucinated, his personality is well preserved and nothing in his trend demanded his segregation, nor was there any prospect of fundamental improvement under hospital care. Accordingly he was placed in a boarding home, January 11, 1936, where he adjusts well. It should be noted that he had no other means of exit from the hospital, his mother at this time being herself a resident thereof.

Case 3. With a history of three previous admissions, a widow aged 63, was readmitted to the hospital, April 17, 1930, in a manic phase. She stabilized herself shortly, although her convalescence was complicated by a cardiac disorder and a refractory eczema. Her parole was considered many times, but due to her economic situation and the fact that she had alienated all available friends during previous minor episodes, little could be done. Further than that, her future adjustment could not be guaranteed to local agencies. She was placed to board, April 21, 1936, in her home city and granted old age assistance the following October. She was transferred to parole status, has adjusted well to date (she has been followed since) and was discharged October, 1937. This letter from her is similar to many others:

"I thought I would drop you a few lines and let you know how I am getting along. I am feeling fine. Glove business is not very good, but I have some. I was allowed $23 from old age assistance, but now they give me $25. Doctor, I have been home over a year and am so thankful for the boarding out plan. Hope all the other patients get along as well as I do."

Case 4. After eight years of hospitalization for hebephrenic dementia præcox, a single man then aged 37 was placed in a farm

home, May 11, 1937. In addition to his delusional formation, there were an underlying deviated personality and wanderlust. Until there was a prospect of leaving the hospital this man refused to be employed except in the preindustrial group. It should be stated that his family had no means of caring for him. His reaction was immediately favorable, his caretaker within a month employed him, and some months later he secured a better job in his own community, where he has continued. This patient's response to community freedom and opportunity for employment is striking considering the nature and duration of his disorder. Psychiatrically we had anticipated a comfortable adjustment at the same level and attribute his awakened interest to the influence of the farmer's personality.

Case 5. An Italian cobbler, 42 years of age, was admitted to the hospital during December, 1924, manifesting well-defined paranoid dementia præcox. His wife secured a divorce and remarried. A committee was appointed and his rather substantial property was sold, the proceeds going toward his daughter's education. Later, while employed in one of the hospital shops he rapidly improved and regained insight, being able to discuss his former trend objectively. Inasmuch as there was no other form of egress from the hospital, a boarding home was found with a compatriot, also a cobbler. This patient has adjusted well and is self-supporting. Significantly, his attitude towards the hospital is friendly. This man's psychosis bereft him of his family, business and savings. He had a difficult readjustment to make and fortunately stepped back into society through a sympathetic family of his own cultural background. Further than that the caretaker was a boyhood friend, followed the same occupation, and gave him opportunity for work. It may be noted that he was accepted by the children of the family and appeared to be helped thereby.

Case 6. At 53 years of age a single, self-centered woman who had been overprotected by her formerly well-to-do family was admitted as a consequence of a mixed manic-depressive reaction. She had never been employed. Her personality is well illustrated by the fact that although she had completed her high school work she stopped attending in order to avoid the graduation exercises. At

the hospital her improvement was retarded, she was most self-depreciatory, and she resisted every attempt to advance her to more comfortable wards. Finally she seemed well enough to leave the hospital, but her family had readjusted themselves to their depleted circumstances without provision for the patient. Because she had been so difficult in the past they could not be persuaded to try her on parole, and were very dubious about foster home placement. After much effort the patient's own resistance thereto was finally broken. Sunday dinner with the family in the prospective boarding home precipitated her decision. The picture of family life into which she was projected had much to do with her partial resocialization. She later resisted removal to a more comfortable urban home where the prospect of employment was greater. Further, her underlying personality had begun to grate and undoubtedly her resentment of the foster mother was in part due to her unsolved Electra situation. In this second home she was encouraged to make more outside contacts and the caretaker was less aggressively maternal. Finally, after much travail, chiefly with the patient, placement was secured as a working companion on salary. It should be noted that the patient now takes all credit for securing this position, being unaware of the manipulation involved. Psychologically this appears to have been of definite value to the woman.

Case 7. A mill worker, 29 years of age, made a poor adjustment at the hospital. His was a typical case of dementia præcox, simple type. It was impossible to return him to his home because of his relationship with the unsympathetic stepfather, and he could not be conscientiously recommended to his former place in the mill. Although city bred, this man has made an excellent adjustment in a rural foster home. Displacing his apathy there is now a decided interest in the care of the farm livestock. However, he has so far refused to leave this home to go to a remunerative farm job, a repetition of his first resistance to boarding home placement. It is interesting that this patient is mother-attached, that the foster father is not robust, and that he (our patient) has assumed considerable responsibility in the home under the guidance of the woman of the house. Efforts to make him self-supporting are being continued, although therapeutic benefit is already obvious.

Case 8. Seven weeks after a head injury at work, a male aged 36 developed a paranoid reaction which later was proved to be neurosyphilitic. Consequent upon improvement after adequate therapy, parole was considered but obstacles were encountered. His wife and his daughter (whose vision was failing rapidly) were also receiving antiluetic therapy. Their resentment to his projected homecoming was sharpened by the prospect of the termination of his compensation and the fact that his company refused to take him back to work. Many efforts were made to change the attitudes of both the patient and the employer. Meanwhile the patient, chafing at the delay, developed a paranoid attitude toward his family, his former employers and the hospital physicians and social workers, but his original persecutory trend remained in abeyance. Nine months of boarding home placement demonstrated that he could adjust in the community and changed his attitude toward the hospital. Moreover, at odd jobs he had earned enough to outfit himself and returned on parole to his family, laden with presents. He secured his old position, his seniority rights were restored, and the family continues amicably reunited. Their consequent improved economic status has taken this family from a dispensary clinic to their own private physician for further treatment.

Case 9. Although she was diagnosed psychoneurotic, there were some psychopathic features in the case of a 40-year-old single woman readmitted after a suicidal attempt. Her adjustment was also complicated by a crippling osteoarthritis which precluded her from seeking employment in her former occupation of librarian. Despite her intelligence, a series of paroles were short-lived because of her difficult personality. The family had rejected her for this reason too, and because of their economic circumstances. Boarding home placement led to employment, which she lost; another foster home was found. She was employed for a time in a clerical capacity, having acquired some night school training and practical experience at the hospital. She herself found a working home, later was returned to the hospital for more orthopedic surgery with a good result, and then went to another foster home. Shortly she found employment and has remained employed since August, 1937. This woman is able to verbalize her gratitude for the opportunity to reestablish herself in the community provided

by the boarding-out plan. She is also able to describe the psychological "lift" such placement afforded her.

Case 10. A cyclothymic immature girl of 18 was transferred to this hospital, December 3, 1935. There had been two previous successive residences totaling 14 months with failure on parole, despite careful planning and supervision. As a child she had been unfavorably conditioned at home and in an orphanage. There had been feelings of inferiority engendered by a marked myopia and her mother's tragic death at this hospital. As an instance of immaturity, her ill-considered ambition to become a dancer interfered with practical considerations of boarding home placement. This was undertaken February 26, 1936, where an opportunity was available to continue her interest in hairdressing, developed at the hospital. Her reaction was unsatisfactory probably because she felt she had not received enough attention. Replacement in a home connected with a dancing school, because of her undiminished terpsichorean yearnings, occurred May 5, 1936. Upon her own initiative she had attended part-time W. P. A. commercial school. It later developed, however, that she had corresponded with a personable and well-educated former patient. Finally he met her at school, took her out and attempted seduction. Her absence from home was quickly reported, she was located without delay by the boarding home mother and returned to the hospital forthwith.

Further placement, from an administrative standpoint, seemed foolhardy. However, considering her youth, her previous effort to equip herself for work and the alternative of continued hospitalization with little hope for the future, it was decided that she should have another trial. This was done August 25, 1936. There have been two further shifts, to homes offering more comfort and some remuneration. Of her own volition she has attended high school and completed her senior year. Since, arrangements were made for her to gain experience in a business office. There has been no difficulty, she has improved and has been relatively stable.

Case 11. The case of another young individual deserves reporting. He is the product of a home broken by an irresponsible father and by the hospitalization of a psychotic mother. The early environment was deplorable from an emotional standpoint, there was

no security of any sort, and actual privation was the rule. Older siblings broke away early. Nevertheless our patient completed high school. He still is intensely attached to his mother and younger siblings, and plans to reunite the family. He is schizoid to an extreme, there is conflict over masturbation, and he has insisted upon returning to his birthplace, which is also the location of the hospital in which his mother is a patient. Local authorities considered him incorrigible, and only at the insistence of the clinic physician was commitment to a correctional institution avoided.

He was admitted here November 2, 1937, then aged 19 years. Although his formal behavior was not objectionable, he made a poor adjustment. Wishing to avoid an exacerbation of his mental symptoms or the possibility of his becoming too well hospitalized, he was placed in family care, December 28, 1937. This home provided excellent foster parents who have three sons of their own. With the assistance of a local agency he was enrolled as a student mechanic in a State aviation school. It had been the only interest upon which he had been articulate, and he had had some previous training. At first his adjustment was mediocre and his reaction unfavorable. Later there was more interest in his work, he did well in the home, and his personal appearance improved to a degree. Continued supportive treatment is definitely indicated here, and the prognosis is dubious.

Boarding home placement is useful in the individual who has completed insulin therapy and requires early community placement[6] but is without relatives or funds. In this connection we have in mind the following case.

Case 12. This patient, a woman, presented a typical paranoid schizophrenic reaction upon admission, April 29, 1936. The duration was three months, the onset was abrupt, and she showed considerable affective reaction and hate toward her alleged persecutors. Her personality was well preserved. Improvement under insulin therapy was sufficient to justify a trial in the community and seemed indicated. On June 3, 1937, she was placed in a boarding home, there being no responsible relatives. In this home stimulation by contact with two business women was of psychological benefit. The patient secured employment at a summering place, returned to the city in the fall, found work and has continued to

make a fair adjustment on parole. She is particularly grateful for her self-supporting status.

From the standpoint of hospital administration, the following case may be outlined:

Case 13. A single youth, 21 years of age, was admitted to the hospital, November 23, 1932. He had been overprotected by his psychotic mother, had become increasingly introspective, sensitive and seclusive, and had developed a rather typical schizophrenic trend of reference. For some time he refused to leave the house except at night and had allowed his beard and hair to grow. Much persuasion was required to cajole him onto a parole ward and into employment about the grounds. Much later he became efficient in caring for the laboratory animals. His parole was urged; thorough investigation showed that return home or to other relatives would be highly injudicious. Desirable farm positions were found on two occasions, but from both he returned shortly to the hospital of his own accord. Profound feelings of inferiority interfered with his adjustment to employment and society. However, he readily adjusted to boarding home status on a small chicken farm. It should be noted that the boarding home mother was obviously a mother surrogate, that his needs in this respect were great, and he had finally found a place in the sun. His attitude toward employment was modified in that he took entire care of the poultry in return for his board, and applied knowledge gained from literature to their care. Six months later when the foster father died he was obliged to find another place, and subsequently adjusted as farm laborer with wages in two positions, leaving the first from no fault of his own.

This young man had been filling a job at the hospital for which he had required some training, and in which few patients may be placed. Having in mind the regard pathologists exhibit toward their animals, especially if there have been epidemic disorders among them, hospital administration would dictate that another patient should have been selected for placement in the community. However, the institution is a psychiatric hospital, and the man was but 24 years of age. Further, from an economic standpoint this man has been self-supporting in the community for three years. Parenthetically, we may note that soon another patient, older and

frankly delusional, was functioning smoothily as an animal attendant.

The last case to be discussed is one in which the prognosis for adjustment in family care seemed hopeless from a social and psychiatric viewpoint.

Case 14. A mentally defective woman, aged 40 on admission July 25, 1934, was found to present a psychosis based upon syphilitic meningoencephalitis. Over and above the usual mental symptoms she had been a community nuisance over a long period because of shameless exhibitionism and brazen soliciting. Local social service agencies had worked earnestly but unsuccessfully with her. Following malaria therapy and other adequate treatment, and coincident with mental and physical improvement, her parole was considered. This suggestion gave rise to a clamor of protest from the agencies concerned, particularly as her husband was a patient in a government hospital and there were no other relatives to take any responsibility. However, representatives of these agencies were favorably impressed by the patient's improvement, and cooperated to the fullest extent. After two months planning she was placed to board, September 17, 1935, in a specially-selected home at the expense of an agency interested in her welfare. It should be noted that this placement was made in another community, that the patient became helpful in the home and that with close supervision there was no overt difficulty. Antiluetic therapy was continued. During January, 1937, she was given wages for her services in the boarding home and placed on parole. Although she has been discharged from the hospital, the contact has been continued with favorable reports.

Comment

In reviewing our experiences we may say again that we have been fortunate in avoiding all the dangers generally cited.[7] As alluded to above, we believe this may be attributed to the method followed. Conservative, unhurried selection and placement, together with conscientious case work, is the rule. The possibility of exploitation of patients requires constant vigilance, although genuine interest in their charges is usually evinced by the foster families. Exploitation of the boarding home system by individuals

who may have their harmless psychotic relatives admitted to the hospitals with a view to later boarding home placement is a future potential abuse. It is obvious that no relative should be reimbursed for caring for a patient.

Some thought should be given to the mental hygiene of small children in the foster home.[8] It may be argued, however, that because the patient has little emotional value to the child as an extra-family figure, this matter may not be of prime concern. In this respect each case should be decided individually.

Certain claims have been made for the boarding out procedure from an administrative standpoint. It has been held that economically the system is advantageous to the hospital.[9] This assertion has been challenged except when a sufficient number of patients are so placed, for the hospital setup is planned to meet the natural variation in population from day to day. However, we must further advance the view that the deciding point is the saving to the hospital over the period of years a patient may readjust in the community after being established by foster family care. It has also been maintained that this procedure may postpone new hospital construction and does provide more beds for those requiring intensive hospital treatment. Unfortunately, however, cases for placement have not yet been regularly selected from active treatment services but from parole wards, which are rarely overcrowded. Yet it may be noted that the group in foster family care at the time of this study would occupy one usual hospital ward.

So long as occupational therapy forms an integral part of treatment, and useful work provides the greatest ego-satisfaction, the employment of patients in the shops, gardens and other hospital industries must be continued. The hospital system has evolved, taking into account this important factor of patient labor. Thus no patient should be taken from constructive hospital employment whose prospects of social adaptation are not reasonably good. However, foster family care which of necessity must absorb those patients calculated to make a social and economic adjustment in the community, if it is to be constructive, may affect the administration of the hospital.[10] On the other hand the primary function of the psychiatric hospital is not to maintain itself but to rehabilitate individuals. Therefore the progress from adjustment in the hos-

pital at work, through foster care, to community readjustment is a logical sequence of events.[11] In this connection it may be stated that not a few of our shop employees have evinced interest in the subsequent progress in the community of their former charges. With further expansion of the boarding out procedure, it seems possible that adjustments in hospital personnel and the greater employment of less amenable patients in the industrial group will follow.

Summary

1. Over and above all other considerations, sociological, economic, administrative and the like, foster family care is an efficacious form of therapy[12] rather than a mere custodial procedure. A definite abatement of psychotic symptoms is the rule.

2. This therapy helps one "whose foes are within himself" and his own household particularly. It can also be applied to the bewildered or asocial adolescent by introducing him into a controlled environment under helpful supervision. By this community freedom self-respect and reliance may be restored and the patient's drive directed into socially acceptable and ego-satisfying channels.

3. The positive effect of the objective attitude of the foster family toward the patient's illness may be contrasted sharply with the subjective attitude of his own family. A significant function of the boarding out procedure is the opportunity to prove to the family that a given patient is able to make a social adjustment and to allow that family to make a readjustment within itself toward him.

4. To obviate untoward occurrences and disadvantages the necessity for careful, unhurried selection of patients and homes, conscientious case work and constant cooperation between all conerned, including the patient, may be stressed again. Failure of several placements does not preclude either the patient or the home from further trials.

5. The value of foster family care following insulin therapy, with reference to potential old age pensioners, those in whom there is no prospect of parole, in young individuals to avoid possible chronic institutionalization, and in certain apparently hopeless cases from a social standpoint, has been illustrated.

6. Underlying personality and the possibility of achieving economic security appear to be factors in the patient making for successful adjustment in foster family care.

7. The other advantages of the boarding out system to the patient, hospital, State and the foster family, discussed in some detail by other writers[7, 13] have been confirmed in our experience. One of these should be cited again. As a means of practical mental hygiene education foster family care excels.[14] It is a concrete method, it proceeds by word of mouth, and it reaches people untouched by any formal program.

8. For the patient, physician, and particularly the social worker, this procedure has removed much of the frustration previously attendant upon the blocking of the final step in resocialization of many patients.

9. In contrast to some other systems,[15] boarding home placement is a function of the hospital, not of some local governmental authority. The problems met are primarily psychiatric. An available psychiatric social service force has long been operating to care for paroled patients in the community. It is generally recognized that placement should not be attempted without preliminary hospital observation. In New York State the Department of Mental Hygiene has assumed the responsibility of all aspects of the care of the mentally ill through its widely distributed hospitals. These may most effectively observe, treat, place selectively and supervise in family care certain of those patients entrusted to them.

10. The continued expansion of foster family care seems to be definitely indicated.

Utica State Hospital
Utica, N. Y.

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THYROID THERAPY IN A SERIES OF EPILEPTICS

BY GLENN J. DOOLITTLE, M. D.*

The epileptic is subject to all the acute and chronic physical disorders to which human flesh may be heir with the possible exception of two conditions, namely diabetes and exophthalmic goiter. Recent investigation into the acid base equilibrium of the epileptic may throw some light on the almost universal absence of diabetes in the epileptic. There has recently been at Craig Colony one patient who has shown what may be considered atypical symptoms of diabetes. As to hyperthyroidism, in a series of over ten thousand cases in the above mentioned institution there has been only one case that has shown any evidence of Graves' disease, and this patient has had no seizures since the onset of hyperthyroid symptoms. This, together with the fact that several investigators have found that the epileptic shows a tendency to run a low normal basal metabolic rate, led the writer to investigate the effect of raising the basal metabolic rate by the administration of thyroid extract in the hope that we might see some beneficial effect.

Damon[1] reported on a series of 300 cases of epileptics and 25 normal individuals. His conclusions as to basal rate were—

1. Fifty per cent of 300 epileptics tested show abnormal metabolic rates; the chances are 2 to 1 that the rates will be abnormally low rather than high.
2. More females than males show low rates.
3. Age does not seem to be a factor in determining the occurrence of an abnormal rate.
4. The percentage of abnormal rates in patients given phenobarbital does not differ from that in the untreated group.
5. In a group of 50 patients having a remission of seizures over a period of one year or more, the percentage of low rates was not as great as in the group having seizures.
6. The duration of the epilepsy does not seem to be a determining factor.
7. The percentage of low metabolic rates is greater in patients having frequent attacks.

*The writer desires to express his appreciation to Dr. LeGrand A. Damon, pathologist at Craig Colony for his painstaking work on basal metabolic rate and blood sugar determinations, and to Dr. M. R. Perry for her help in determining the later blood pressure readings.

8. Determinations of basal metabolism in epilepsy are of value in offering clues as to the etiology, and suggestions for treatment in selected cases.

Lennox and Cobb[2] state, "In our experience the coexistence of hyperthyroidism and epilepsy is rare. In fact we have seen only one such patient, a woman with well-marked signs of exophthalmic goiter and a basal metabolic rate 37 per cent above the average normal."

Lennox and Wright[3] found that one-fourth of 130 patients consumed an abnormally small amount of oxygen per unit of body surface which might possibly indicate hypofunction of the thyroid gland. They state that about 69 per cent of epileptic patients show rates between minus 10 and plus 10 whereas 92 per cent of normal individuals fall within this rate. About 97 per cent of those suffering from chronic nervous exhaustion, while 84 per cent of neurasthenics come within these figures, and 86 per cent of those suffering from gastro-intestinal disturbances are within these limits. Lennox and Wright further state that apparently the coexistence of exophthalmic goiter and epilepsy is rare.

Lennox and Cobb[2] state, "In our experience, raising the basal metabolic rate to the normal level by means of thyroid extract was not accompanied by a decrease in the frequency of seizures."

Gordon[4] noted improvement in six patients following administration of thyroid extract. On the other hand, patients treated by Prior and Jones[5] appeared to be made worse by thyroid administration.

Elsberg and Stookey[6] confirmed the findings of Uyematsu and Cobb[7] namely that the susceptibility of rabbits to induced convulsions was apparently increased by thyroidectomy.

Talbot[8] says, "The numerous reports of the effect of thyroid therapy in epilepsy are evidence that there has been much interest in the relation between this gland and the syndrome of recurrent convulsive attacks. The data given are highly unsatisfactory. Some authors state that administration of thyroid preparations has brought great benefit, others that it has been of no therapeutic value, and still others that it has been harmful. The fact that the basal metabolism is below normal in about 12 per cent of the cases

reported might be taken as evidence that a proportion of the cases are hypothyroid. This conclusion cannot have unqualified acceptance since other factors have a definite influence on the basal metabolic rate. The clinical test of thyroid therapy in these cases is usually disappointing."

Consec. No.	Pres. Age	Classification	Onset	Before	Seizures During	After
7906	32	Unclassified	16 yrs.	16	93	12
8076	41	Unclassified	11 yrs.	13	13	16
7059	46	Unclassified	23 yrs.	11	10	10
6674	30	Unclassified	14 yrs.	12	33	11
9984	13	H.Trau.Sub.B.	7 yrs.	86	57	67
8714	15	Hem.at birth	9 yrs.	13	16	4
5342	24	Unclassified	3 mos.	11	10	14
8258	23	Idiop.	12 yrs.	8	10	9
9429	27	Scarlet Fev.	4 yrs.	8	7	4
10143	14	Unclassified	9 yrs.	10	17	7
7530	23	Trauma	5 yrs.	12	13	14
9913	18	Unclassified	6 yrs.	12	6	8
8706	22	Unclassified	10½ yrs.	6	15	11
9200	25	Unclassified	16 yrs.	28	9	5
5938	27	Unclassified	1 yr.	17	31	13
8440	20	Idiop.	13 yrs.	7	7	7
9739	21	Unclassified	14 yrs.	6	36	4
5320	56	Unclassified	20 yrs.	7	2	12
10142	22	Unclassified	2½ yrs.	13	17	14
1831	36	Unclassified	(?)	16	11	32
7616	51	Idiopathic	10 yrs.	8	4	4
9641	19	Idiopathic	3 yrs.	7	13	11
4663	35	Unclassified	11 yrs.	6	9	5
1688	44	Unclassified	(?)	17	16	12
7467	42	Unclassified	(?)	7	8	4
9685	28	Unclassified	17 yrs.	20	31	68
9000	18	Unclassified	1 yr.	17	22	16
10136	37	Unclassified	22 yrs.	5	15	8
7923	35	Unclassified	19 yrs.	12	25	15
9974	19	Unclassified	8 mos.	11	4	7
9522	47	Idiopathic	3 mos.	10	5	3
8403	19	Idiopathic	3 yrs.	12	24	12
9022	26	Idiopathic	2 yrs.	8	8	50
8539	22	Idiopathic	12 yrs.	14	9	16
7242	24	Unclassified	9 yrs.	20	25	29
9799	20	*H.Trs.Sub.B.	10 yrs.	12	34	56
10439	15	# M.E.Men.	13 yrs.	10	21	15
7441	36	Unclassified	17 yrs.	6	6	5
8137	28	Men.Enc.	13 yrs.	8	9	11
7116	24	Unclassified	2½ yrs.	13	10	13
9006	20	Men.Enc.	6 yrs.	38	23	18
10251	15	Unclassified	12 yrs.	51	26	36
6230	12	Ess. Epilepsy	4 yrs.	17	23	13
9333	19	Unclassified	13 yrs.	10	14	14
7290	25	Unclassified	3 yrs.	17	22	11
5495	44	Unclassified	9 yrs.	8	7	9
6532	25	Unclassified	5 yrs.	6	5	6

*Head Trauma Subsequent to Birth.
Meningo-encephalitis following Measles.

The writer feels that those who have had any dealing with epileptics, of the institutional type at least, find that the majority of these cases run a low basal metabolic rate.

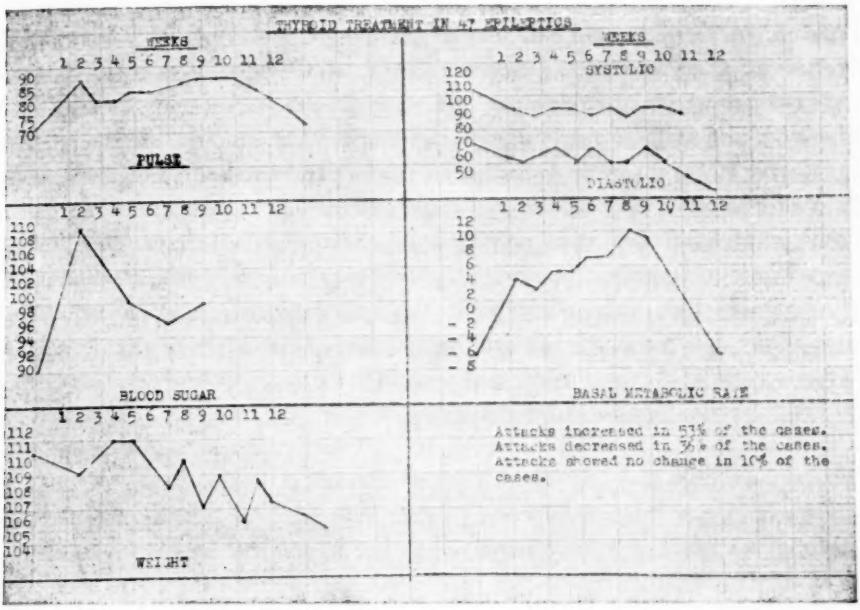
Out of approximately 2,500 cases now resident at Craig Colony there are 15 cases of thyroid enlargement. None of these, however, show any evidence of hyperthyroidism, thus indicating that simple thyroid hypertrophy does occur among epileptics.

The writer corresponded with George W. Crile of Cleveland, and had personal interviews with Martin Tinker of Ithaca and William D. Johnson of Batavia, relative to the incidence of chronic convulsions seen in cases of Graves' disease coming under their observation. The consensus of opinion was that they were unable to recall coexistent epilepsy and exophthalmic goiter except in one instance, a case reported by Tinker. They were also consulted as to the dosage and its frequency, and for any probable deleterious effects that might occur from the administration of thyroid extract over a period of three months.

Forty-eight female patients were then selected at random, the only requisites being that the patient was in good physical condition, and of sufficient mentality to cooperate in the treatment. Three basal metabolic rates were taken on each prior to the administration of the extract to secure an average basal rate for each patient. They were then placed upon one-half grain of thyroid extract night and morning, and an accurate record kept of pulse, blood pressure, weight, blood sugar and basal metabolic rate. Tremors and other symptoms of hyperthyroidism were noted. After a month of thyroid treatment, it was noted that the basal metabolic rates did not increase as rapidly as might be expected. Therefore, the dose was increased to one grain, twice a day and in some cases as often as three times a day. This procedure was carried on for three months, when basal metabolic rates were repeated. Blood pressure, pulse and weights were recorded and compared with the preadministration period as shown on graph.

Beginning February 10, 1937, therapy was continued through the entire three months in all 48 patients with the exception of one who early showed a marked increase in basal metabolic rate, considerable tremor, noticeable loss of weight and increase of seizures. It was thought best to discontinue this treatment. The general results expected were not entirely realized, and the effect on seizures will be noted under the various headings. The patients all continued about their usual occupations at the institution which in-

cluded housework, laundry work, school, occupational therapy, et cetera.


THYROID TREATMENT IN 47 EPILEPTICS
WEEKS
1 2 3 4 5 6 7 8 9 10 11 12
PULSE
SYSTOLIC
DIASTOLIC
BLOOD SUGAR
BASAL METABOLIC RATE
WEIGHT
Attacks increased in 51% of the cases.
Attacks decreased in 39% of the cases.
Attacks showed no change in 10% of the cases.

The effect of thyroid extract on the pulse, weight, blood sugar, blood pressure, basal metabolic rate in a series of 47 epileptics

Basal Metabolic Rate

Ninety-one per cent, or 43 out of a total of 47 cases, showed an increase in basal metabolic rate, the amount varying from 3 to 45 points, an average increase of 18. The basal metabolic rate increased in the group as a whole from minus 7 to plus 11 as is shown on the graph. We must conclude from these figures that we were getting some effect from the use of the drug. Of the 43 cases showing increase of basal metabolic rate, 26, or 60 per cent, of them showed increase in seizures, 17, or about 39 per cent, showed a decrease in attacks, while about 1 per cent remained unchanged.

Of the 26 patients showing an increase of seizures during the medication, (in one-half the frequency was doubled) 4 returned to pretreatment level. Six showed a decreased number of seizures following the withdrawal of the drug over the pretreatment aver-

age. Sixteen, or 61 per cent, of these 26 cases showed an increased posttreatment average number of seizures.

Four cases showed a decrease in basal metabolic rate varying from 1 to 16 points. Of these, 2 showed a decrease and 2 an increase in attacks during the medication, 3 of the 4 were below the pretreatment level following the withdrawal of the drug, and 1 had more seizures following the withdrawal than before the treatment.

Of the 17 cases whose seizures decreased during the administration of the drug, 6 suffered about half as many seizures during the treatment as prior to it. It is interesting to note that the patient showing the highest basal rate change, from minus 8 to plus 37, showed no change in pulse rate, an increase in blood sugar, a gain in weight, no tremor and no change in seizures. In practically all these cases the basal metabolic rate returned to normal within 10 days after withdrawal of the drug.

Blood Sugar

Blood sugar was taken every two weeks. It showed a pretreatment level for the group as a whole of 90 milligrams. From this it rose at the end of the first two weeks treatment to 109 and then dropped back to 95 remaining between 95 and 97 until termination of the treatment. Thirty cases showed an increase in blood sugar; of these 18, or 63 per cent, experienced an increase in seizures, 12 a decrease or no change. Fourteen, or 29 per cent, of the cases showed a decrease of blood sugar. There was a decrease in seizures in 6, an increase in 6, while two remained stationary. The blood sugar change in the group as a whole was small, only 6 milligrams as shown on the graph. The greatest individual change was plus 49 and in this case the seizures decreased somewhat.

Weight

The weight average for the group before treatment was 110.9 pounds. This decreased gradually during the treatment until at the end of 3 months the curve reached 106.1 pounds. Thirty-one, or 64 per cent, of the 47 patients lost weight. Of these, 16, or 61 per cent, showed an increase of seizures, 15, or 49 per cent, a decrease. Six of them gained weight. Of these, 3 had an increase in attacks, while 1 had fewer and 2 remained unchanged. Of the 9

showing no change in weight, the number of attacks decreased in 4, increased in 5. No cases showed a great variation in weight, and weights returned to pretreatment level almost immediately following removal of the drug. So far as can be determined the change of weight seemed to have no effect on the attacks.

Tremor

Of the 47 cases treated, only 17, or 36 per cent, showed tremor and in only 4 of these was it marked. Fifty-three per cent of these marked by tremor showed an increase in attacks, whereas 41 per cent showed a decrease and in 1 there was no change. However, of the 4 showing marked tremor, 3 had an increase in seizures although it was not more marked than it was in the others. Tremor ceased following removal of the drug. The writer feels that under the dosage of thyroid extract which we were giving, tremor should have been commoner.

Blood Pressure

Forty-four, or 93 per cent, of the 47 cases showed a decrease in blood pressure reading during the treatment. This was about what the writer had expected. The diastolic pressure fell more than did the systolic. An interesting finding was that, of 25 cases showing a drop in diastolic pressure out of proportion to the systolic drop, 21, or 84 per cent, had an increase of seizures, 4 showed a decrease. Among the 44 presenting a decrease in systolic pressure only 26 showed an increase in seizures. Thus, we find that where the diastolic drop was disproportionate to the systolic, 26 per cent more of the patients showed an increase of attacks. It would seem, therefore, that where this occurred, to increase the heart load, there was an increase in seizures in a very large percentage of the cases.

Of 10 patients showing the highest increase of seizures after the withdrawal of the drug, 8 were in the group whose diastolic pressure fell the most.

Pulse

The pulse rate for the group as a whole rose from 74 to 110 at first, then it gradually dropped to 87 and remained approximately at this level. However, following the withdrawal of the drug the pulse did not at once return to the pretreatment level.

There seems to be no correlation between the pulse rate and the increase or decrease of attacks as shown by the following: Of those patients showing a pulse rate of 90 or over, 50 per cent experienced increased attacks, 42 per cent fewer attacks and 7 per cent no change. Among patients whose pulse rate varied between 85 and 90, 55 per cent experienced an increase in seizures, 27 per cent a decrease, 16 per cent no change. Of those having a pulse below 85, 46 per cent showed increase, 46 per cent decrease and 8 per cent no change.

During the three-month period following withdrawal of the drug, 27 of the patients returned to the average number of seizures, or to less than they were having prior to the treatment. Twenty continued at a higher frequency. Of the patients showing much improvement following the withdrawal of the drug, 50 per cent had shown more seizures during the treatment than before. Of the 10 cases with greatly increased attacks following the withdrawal of the drug, 8 showed a fall in diastolic blood pressure.

Twenty-four of the group of 47 patients included in this study were on phenobarbital, while 23 received no medication, 63 per cent of the patients on phenobarbital suffered increased seizures during treatment, 36 per cent decreased. Of those patients who received no sedative medication, 55 per cent showed an increase in attacks, 45 per cent a decrease.

Conclusions

1. Forty-seven cases of epilepsy were placed on thyroid extract for a three-month period to determine the effect primarily upon seizures, and secondarily to observe any effect that a change in basal metabolic rate, blood sugar, weight, tremor, blood pressure or pulse rate might have in altering epileptic attacks.

2. During administration 53 per cent of the patients showed an increased number of attacks, 36 per cent a decreased number and 10 per cent no change. Twenty-one cases, or 44 per cent, experienced an increased number of seizures for the three-month period following the withdrawal of the drug, and of these, 13 had returned to the pretreatment level 9 months following withdrawal.

3. Ninety-one per cent of the cases showed an increase in basal metabolic rate, 63 per cent an increase in blood sugar, 64 per cent

a loss of weight, only 36 per cent showed tremor, and 93 per cent showed a decrease in blood pressure. Eighty-four percent of the cases in whom a disproportionate fall of diastolic pressure was noted, had increased attacks. Sixty-five per cent showed increase in pulse rate. There seemed to be no relationship between the rapidity of the pulse and the number of attacks.

4. About 50 per cent of the patients were receiving phenobarbital. This sedation seemed to have no influence upon the frequency of attacks under thyroid extract.

5. Eighty per cent of these patients were unclassified, 20 per cent organic. Of the unclassified group 76 per cent showed an increase of seizures, whereas of the organic 62 per cent showed an increase of seizures.

6. The writer feels that an improvement with respect to the number of attacks while under thyroid treatment was evident in 35 to 40 per cent of the series presented. From 60 to 65 per cent appeared to be made worse by the drug. Approximately the same percentages were noted in correlating seizures with changes in basal metabolic rate, blood sugar, weight, blood pressure or pulse rate, and with incidence of tremor. A patient subject to unstable diastolic blood pressure or a diastolic blood pressure easily decreased by thyroid extract should not be given this drug.

Craig Colony.
Sonyea, N. Y.

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THE INVOLUTIONAL (MENTAL) SYNDROME

BY G. M. DAVIDSON, M. D.

Orientation

According to the Grammar of Science of Pearson, the development of every science passes through the stages of observation, classification and the establishment of general laws. In reference to psychiatrical disorders, it is evident that we are unable to speak as yet of general laws; in fact, we still have to master the stage of classification.

Consider, for instance, the gross division of psychoses into organic and functional. Such division is obviously conditioned by the mechanistic outlook, and is untenable from the present dynamic viewpoint. In a sense, every mental disorder is both organic and functional, since there is no function without structure; moreover, it is known that a demand for function will hasten the completion of structure, and above all it is well established that impairment of function will produce greater changes than will damage to morphology. We also know that certain morphological changes, such as cerebral arteriosclerosis, for example, may or may not be accompanied by mental phenomena. The statement becomes comprehensible if we consider a psychosis to be rooted in various systems of the total personality, and accept the views of Hughlings Jackson concerning positive and negative symptoms—the former referring to release from control, or escape from physiological check of sublesional centers, the latter being understood by way of functional deficiency.

Consider again the division of psychoses into affective and trend reactions. When critically examined, such division must be considered invalid because if we choose affectivity as a point of departure we observe changes of affectivity in both reaction-types, even if of a different order. We have only to think of the dissociation of affectivity in schizophrenia to appreciate this.

The division of mental disorders into transference and narcissistic neuroses, as offered by the psychoanalytic school, is evidently inadequate. There is no doubt that a number of schizophrenics, as the disorder is understood at present, are able to form a certain

degree of transference, while certain compulsive-obsessives are unable to make transference. Nor can we proceed to classify psychoses on the basis of "fixation-regression," since a person may develop fixations at various levels of evolution. Furthermore, a regression does not remain constant at a certain level, nor can the level itself be exactly established and defined. It is, therefore, gratifying to have psychoanalysts like Schilder state that regression cannot longer be considered the center of a theory of human behavior.

The inability to adequately classify psychoses even grossly, reflects upon itemized classification. In fact, classification of mental disorder varies in different countries, and no matter what classification we shall apply to our cases, we have a considerable number in which a diagnosis is rather forced. A large number of cases cannot be classified at all, for which reason the American classification wisely provides an "undiagnosed" group. It is evident that description as well as interpretation each in itself is insufficient. Progress, however, may be expected if we shall evaluate a mental condition from the standpoints of the total personality and psychosomatic relationship of various systems of the personality.

In connection with the foregoing a few words concerning certain aspects of "causes" of mental disorders seem necessary. First, biology teaches us that what may be believed to be "the" cause is often not the case, and that causes are rather multiple. Secondly, the following observations are of interest. Bonhoeffer, quoted by K. Schneider, stated that there are no specific causes which would produce specific mental symptoms. Hoche, also quoted by Schneider, observed that there are no clinical entities in psychiatry, but only clinical syndromes. Lange states that the diversity of causes does not correspond with the manifestations of a psychosis. The organism responds with only a limited number of reactions; the individual responds to many causes in the same manner. It seems that Lange considers a "reaction" and a syndrome to be synonymous. The writer believes such viewpoint to be erroneous since a reaction implies a fundamental biological tendency which does not change in the same individual. This is obviously not the case in many instances, as observed in our cases. It seems, therefore, preferable to speak of a syndrome rather than a reaction. It is our

purpose to investigate a clinical syndrome which might be called *the involutional (mental) syndrome.*

Originally, the mentioned syndrome would refer to a mental disorder known as involutional melancholia which formerly was considered primarily in connection with mental manifestations associated with the menopause in the female. Later we appreciated that the stated mental phenomena do not need to occur exactly at the time of cessation of the menses, but may take place also many years after the apparent menopause. Little consideration was previously given to the male, because we do not see such striking changes in the reproductive systems of men as we see in women. In fact, it is known that spermatogenesis may occur at a very advanced age. (Metchnikoff quoted a case of such a man 103 years old.) On the other hand, the ancient Greeks had already recognized the situation in the male and called it "grand climacteric" which, they believed, takes place at the age of 63 (climacteric meaning a "rung of a ladder," implying a certain stage of life. Pythagoras and his school stressed the significance of the years 21, 42, 49, 63). The term climacteric is thus preferable to menopause, since it may be applied to both sexes. Marañon speaks of the "critical age." We advocate the term" involution." The latter according to a standard dictionary means: 1. a rolling or turning inwards, 2. reduction in size, and 3. retrograde changes. Such definition seems biologically adequate and is applicable to the situation because it does not refer to a fixed period of life and allows possibilities of readjustment, compensation and recurrences. The statement is correct clinically as well as experimentally. Endocrinological studies of Frank, Goldberger and Spielman, as well as others have shown that estrogenic substances may be present in the blood three years after menopause. It may be also observed 20 years after cessation of menses. The same is also true psychologically. It is known that psychosexual manifestations may continue a considerable time after castration.

As voiced on previous occasions by the writer, the woman's generative phases are most fruitful for the study of psychosomatic interrelationship. We shall, therefore, take the woman's menopause as a standard for comparison. The changes which occur at this time are grossly well known. For the sake of completeness we

shall outline briefly their possible external manifestations. They may be divided into morphological, physiological and psychological. Concerning morphology, the woman, with few exceptions—and then more apparent than real—will undergo a change in appearance, known as "matronly." Even if dietary measures are taken, there will be a trace of this ("rounding" of the shoulders cannot be prevented). The man will also show some adipositas; he may become "portly." Due to the deposit of fat, there is a tendency to develop hernias with their consequences. Physiologically, as far as the external manifestations are concerned, Werner listed all the complaints and their percentage of occurrence. The most outstanding are those referable to vasomotor instability, circulatory, thermal and gastronintestinal disturbances. In the male, we may have difficulties referable to the prostate gland. In view of the gradual involution of the testes, the changes in the male are not so marked as in the female; however, if it comes to a psychosis, the manifestation in the male may be as stormy as in the female. Psychologically, the woman undergoes considerable mental readjustment. The changes will depend upon her original affective constellation, her past experiences, education, attitude toward sexuality, family and social relations, as well as toward the fact of involution itself, as pointed out by Farrar and Franks. For instance, what may "a change of life" mean to her? How does an increase of libido affect her? What about her relationship to the husband in view of his possible excessive sexual demands, or impotence, as well as her frigidity, et cetera? In the man we have also considerable readjustment. There may be as well a transitory increase of libido which if not satisfied, will seek other avenues of discharge. A frequent complication is the partner's frigidity or his impotence. Both partners may be driven to seek younger companions with subsequent hostile attitudes toward each other. In the male, an increase in libido together with impotency may lead to conflict with the law because of the "gerocomic" tendency of compensation (libidinous drives toward children, masterfully illustrated by Thomas Mann in *Death in Venice*), or exhibitionism as a variety of impotence. The woman's potential criminality is also increased at involution, but in a different way. Both sexes show considerable changes in reference to social relations and activity.

The woman, as Marañon puts it, may become virilized. Her activity, tastes, and interests may assume a masculine character. The man, on the contrary, being previously active and creative, will become rather passive. Emotionally, various degrees of instability and anxiety may be observed. Speaking in general terms, the psychological factors center around sexual and social security which is endangered. The briefly outlined manifestations may or may not progress to a psychosis. We are interested here in the latter, the most common being a state of melancholia, which is so well portrayed in the despair of Niobe by Homer.

There have been debates concerning the nature of involutional melancholia. Dreyfus, as it is known, found no difference between involutional melancholia and certain cases of manic-depressive psychosis, inclusive of the prognosis. Kraepelin agreed to this. However, psychiatrists like White, Henderson, Gillespie and others believe themselves justified in considering involutional melancholia separately from the manic-depressive group. The clinical picture of involutional melancholia is well described by various authors. Farrar distinguishes: "melancholia vera," "depressio apathetica" and "anxietas presenilis." Kleist described a clinical syndrome under "involutional paranoia." Albrecht spoke of "presenile paraphrenia" and Seelert emphasized "paranoid states in advanced years." (The labels are believed self-explanatory.) In recent years, Jacobi described the following clinical syndromes: involutional melancholia, involutional paranoia, schizophrenic processes and psychogenic reactions. The issues as presented by him are, however, not very clear. Jacobi speaks of "specific-involutive" symptoms such as exaggerated interest in oneself which may be doubted as a specific element. Moreover, he does not differentiate sufficiently, as far as I understand, an involutional syndrome from involution as a setting. There is also the survey of the problem of melancholia by A. J. Lewis which is of interest.

The outlined opinions show that the difficulties originally ascribed to middle age may take place also in later life, and that there is a great variety of clinical manifestations of involution. It is our objective (1) to show by means of comparison, the validity of an involutional syndrome, (2) to follow up the evolution of the syndrome, (3) to show that the difficulty may occur in early life

due to various causes which in turn may throw some light upon physiological aspects of certain mental phenomena, heretofore, understood only in psychological terms, and (4) to outline the treatment of the condition.

We shall proceed, therefore, with a demonstration of clinical syndromes and psychosomatic mechanisms which are believed to be rooted in involutional changes.

Clinical Material

Seventy cases were investigated in approximately even proportion of men and women. They represented several racial groups of the population of the metropolitan area of New York. They were first admissions and readmissions to State hospitals.

The cases belonged to three groups: Group I consisted of 30 cases representing "depressions" of middle and advanced age, prototype involutional melancholia; their ages ranged from 46 to 75 years. Group II, 20 cases representing "depressions" of early life, prototype agitated depression; their ages ranged from 18 to 35 years. Group III, 20 cases representing miscellaneous mental disorders of various ages of patients who showed involutional symptoms.

The following cases illustrate:

Group I

Case 1. Female, age 49, Swedish, married. Her early home environment was overreligious. Father was very strict, disciplinary. She disliked him. Mother was the opposite, and patient was attached to her. Her education was on religious lines, otherwise very meagre; no sex education. At the age of 15 was taken by relatives to the U. S. Menstruation came on during the ocean voyage. It was puzzling to her and disagreeable. At 19, accidentally discovered masturbation and became a "chronic masturbator." She had no particular desire to get married, but at the age of 21 "gave herself" to her future husband out of loneliness. She continued to masturbate also after marriage, since it gave her more satisfaction than sexual intercourse. There were two children and several abortions and miscarriages. Deliveries very difficult; she suffered considerably which made her horrified of pregnancy. She went through a stormy menopause at which time she found that her husband was unfaithful to her. She turned to religion. Read the Bible considerably and began to interpret it literally. Later de-

veloped an anxious, apprehensive, depressed state. Was self-accusatory; considered herself a great sinner, doomed to destruction, and made a suicidal move. During her illness showed considerable hypochondriasis, expressed nihilistic ideas and those of unreality; her sensorium was clear. Physical condition good. She recovered after a prolonged hospital residence.

Comment. This may be considered a typical case of involutional melancholia. The patient also showed the usual prepsychotic traits of personality, such as overconsciousness. Constitutionally, the patient was of a marked hyperpituitary type. She was rather tall, of masculine body build and somewhat acromegalic. Her emotionality was of a feminine order with a tendency to psychical hypermotivity. Considering the peculiarities of her makeup, the early environment and past life, we appreciate the vicious cycle of psychosomatic interrelationship, and the difficulty of separating cause from effect, as well as the multiplicity of causes.

Case 2. Female, age 52, mixed race, married. Her father pampered her and she was quite attached to him. Mother was puritanical, rather strict and patient disliked her. From an early age was fearful, highly imaginative and "nervous." She spent since childhood most of her time in her father's library, was a great reader and continued to have a literary interest all her life. Had a college education, and followed one of the "free" professions. Menses were established with difficulty at 17, and were irregular. Had little interest in the opposite sex during adolescence. At 24 was twice engaged but broke the engagements because she would find her suitors inferior. Was looking for a "spiritual mate." At about that time left her paternal home. She felt unusually "nervous" and in order to overcome this, joined Christian Science church and became a devout member. During subsequent years was successful and had many admirers. Later suffered considerable disappointment. At 45 went through menopause. Suffered hyperthyroidism with accompanying mental symptoms. Received X-ray treatment with good results. At that time she met her "spiritual mate," fell in love with him but was rejected. She then married an older man who admired her, knowing, however, that it "would not work." It was a failure and patient had some extramarital relations. Since that time began to show definite psychotic symptoms. Was restless, sleepless and apprehensive. In the hospital was depressed, agitated and anxious. Expressed ideas of unreality, was self-accusatory; suffered great remorse for her "improper" sex life. Identified herself with her mother and rejected her. Her sensorium was clear. She later showed a swing to a manic state, from which she made a perfect recovery.

Comment. This case also showed a typical syndrome of involutional melancholia. It is presented to show the swing to a manic state which may follow certain cases of melancholia. Of further interest are the constitutional factors which in conjunction with psychological and physiological changes may throw some light upon psychosomatic relationship. She presented a rather typical hyperthyroid constitution, was youthful in appearance, slender and well built, had excellent teeth, abundance of hair over head and eyebrows, and "bright" eyes. Mentally, she lived in a world of images all her life, and was a seeker of the "naked truth." Psychosexual values were greater than somatosexual. The patient subjected herself to a chronic clash between her "Greek" and Christian ideals which found particular receptivity for explosion during the physiological changes at which time libido increased to the extent that she was unable to master it.

Case 3. Male, age 52, Irish, married. Past life given as uneventful. Described as a friendly but reserved man, religious and overconscientious. Moderate in his habits, janitor by occupation. He married in the twenties, his wife being a timid, hard-working person. There were two children. For the past year the family was in poor circumstances, patient being out of work and having difficulties with "relief." He became restless, sleepless, felt tired and inadequate. Later showed anxiety and apprehension. He had choking sensations in response to which he developed suicidal ideas. His anxiety increased and he began to smell bad odors of gasses wherever he would go. Had feelings of impending danger for his family. In the hospital he continued anxious and agitated. At times revealed feelings of guilt and later expressed ideas of persecution. He related a story involving a woman neighbor who, he claimed, maintained a disorderly house. He claimed that the woman was arrested and thought that she blamed him for her arrest. This story proved a fantasy. The fact was that the woman was a young attractive person who recently moved to the house. Patient became quite interested in her and often watched her from the fire escape. He once took liquor for encouragement and made a feeble attempt to enter her apartment. His sensorium was clear. Physical condition good.

Comment. This patient showed a pronounced syndrome of involutional melancholia with the accompanying physiological changes, circulatory and thermal. Of interest is the projection mechanism which gives the case a paranoid coloring. We shall comment upon it later as well as upon the differentiation from

schizophrenic projection. Of further interest are the olfactory hallucinations as an involutional symptom which the author described in a separate study.

Case 4. Female, age 52, French, widowed. Early life believed uneventful. She is described as a timid, hard-working, religious person, strict in moral principles and of selective affectivity. Sexual and maternal impulses were strongly developed. She married at 20, and was well adjusted to married life which lasted for five years before her husband died. She had by him five children; only two of them survived. After husband's death devoted herself to her children, work and religion. Had no associations with the opposite sex. About two years before admission went through the menopause with the usual symptoms. Recently her daughter introduced to her, her fiancé. The man paid considerable attention to the patient, treating her as his future mother-in-law. He appealed very much to the patient and she fell in love with him. She believed that her love was reciprocated. Would not accept any other explanation for the man's behavior. Could not be reasoned with. Was continuously waiting for him and talking about him. She had, however, lucid moments of short duration when she would show appreciation of her condition at which time would express guilt feelings. She became quite restless, anxious and agitated. In the hospital presented a rather unhappy, hopeless appearance. Was anxious, apprehensive and agitated. She spoke only of her imaginary love affair. On one occasion had a hallucination of seeing herself young and pretty and heard her lover calling her. Her sensorium was clear. Physical condition good.

Comment. Patient was considered of a hyperthyroid-adrenal makeup. While her sexual impulse was strongly developed she was able to sublimate it until the menopause. The increase in libido made it impossible for her to resist a love object which appealed to her. Of especial interest is the mental content, which appears to be contrary to the teachings of psychoanalysis, namely, that involutional melancholia is due to withdrawal of libido from, or to loss of, love object. Here we see a forceful and exclusive investment of libido in a love object which is beyond control.

Case 5. Female, age 48, mixed race, widowed. Described as a reserved person, very practical and precise. Saleslady by occupation. Married at 24; had no children because of fear of impairing her health. Marital adjustment was not good. Her husband died some ten years after marriage. She remained distant to the opposite sex. Menopause believed to have oc-

curred about six years before admission. At that time had a nervous breakdown. She felt tired and depressed, and had to rest for some six months. Later returned to work. However, was not particularly well since. About six months previous to admission she made a move to marry but broke the engagement off after a quarrel. Subsequently, felt weak, depressed and would faint. At times appeared drowsy; would stagger. In the hospital was melancholy; at times appeared lethargic. Expressed ideas of guilt; was self-accusatory and complained of terrible rumors circulating about her immoral conduct. Was hopeless in her outlook. Her sensorium was essentially clear. Physical condition good.

Comment. This is an interesting variety of involutional melancholia. Kisch first described the condition in 1874. He wrote of women who during the climacteric develop a condition characterized by dizziness, uncertainty in gait, emptiness of facial expression, and appearance as if intoxicated. He called the condition a state of "pseudonarcotism." Our case closely demonstrated the syndrome. If not recognized, the situation may be mistaken for a toxic state due, for example, to alcoholism. The author postulates that we deal in such cases with a toxic state due to hormonal autointoxication.

Case 6. Male, age 66, Italian, married. Early life unknown. Came to the U. S. at the age of 38 and worked here as a painter. Described as a seclusive, suspicious person of average intelligence. He married at 46. Marital adjustment was poor. He was pathologically jealous, and his wife finally left him six years after marriage. The onset of his psychosis was gradual. He elaborated more and more about his wife's alleged infidelity. Finally developed ideas of persecution. Believed the wife hired people to kill him. He had vasomotor instability, felt temperature changes in his body and thought they were due to syphilis contracted from his wife. He would not believe laboratory reports to the contrary. In the hospital was restless, quite delusional with the above trend. He smelled bad odors, felt like a woman, and referred to feelings of metamorphosis with reference to the body-image as well as sex-reversal. He was well preserved. Sensorium clear. Physical condition good.

Comment. Patient showed a feminine body style of build. He had practically no hair over his body. He never shaved and had only a meager growth of hair over the upper lip. The situation definitely pointed to hypogonadism. Psychologically, he rejected his wife and projected his difficulties upon her. Otherwise he

showed an involutional syndrome, except for affectivity, which was of a schizophrenic order. Depending upon the orientation of the psychiatrist, and assuming no prejudice from official classification, the case may be considered as one of involution schizophrenia or involution paranoia of Kleist or involution paraphrenia of Serko. Most important is it to recognize the involutional mechanism, for purposes of adequate treatment.

Case 7. Male, age 64, mixed race, single. His past life is given as uneventful. Good natured man of restricted interests and of deficient intelligence. However, he always was self-supporting and managed family affairs, living with two other bachelor brothers. Had no apparent interest in the opposite sex until very recently when he began to talk about marriage. Began to buy gifts for young female employees. He further began to express ideas of feeling his breasts swelling as a woman's; of feeling like doing women's work. Was anxious and agitated. In the hospital presented the same attitude and mental content. At one time complained that a negro patient attacked him with sexual intent, which proved a phantasy. He improved. Feelings of sex-reversal subsided and he had some insight. Sensorium was clear. Physically, showed mild arteriosclerosis.

Comment. This case is quoted because of the symptom of sex-reversal which manifested itself in both morphological and psychological fields.

Case 8. Male, age 60, Irish, single. Past life claimed to have been uneventful. Described as a mild-mannered man, hard working, friendly but reserved; inclined to indulge at times in liquor. Had little interest in the opposite sex but associated with prostitutes from time to time. About two weeks previous to admission he was believed to have indulged in drink and did not return home. He was taken to the hospital by a social worker whom he knew, and to whom he complained that people accused him of having attacked sexually a small girl. In the hospital was well oriented. Showed no defect symptoms other than some haziness about his admission to the observation ward. He admitted that he had drinks following which he began to hear a voice accusing him in the manner stated. The alleged sexual assault was upon the 12-year-old grandchild of his landlady. The patient had cared for this child since she was five years old. He believed in the reality of his experience. Physical condition good, despite systemic lues, for which he had received adequate treatment at a dispensary.

Comment. The case is quoted for the reason of the gerocomic tendency, known to occur during involution. In this case it mani-

fested itself in phantasy. During his residence the patient showed improvement to the extent of having insight. Later he relapsed, and began to elaborate more and more upon his alleged misdeed. The case could be diagnosed as involution paraphrenia of Serko or presenile paraphrenia of Albrecht. The elaborated material was rooted chiefly in the senile involutional gerocomism.

Case 9. Female, age 71, German, single. Described as a seclusive person, reliable, overreligious. Supported herself as a seamstress. Puberty was late; menstrual history irregular. Had only minor sexual experiences when young; was apparently fearful of the opposite sex. At the age of 28 had a mental attack similar to the present one. Was depressed and felt "lost from God." At the time of menopause had another mental upset which lasted longer. The present attack was of about two years duration. It began with fatigue, insomnia and restlessness. Later she became anxious, apprehensive and hypochondriacal. Was unable to work and her memory was unreliable. In the hospital presented a hopeless appearance; was agitated. Claimed that something in her head prevented her from closing her eyes and therefore, she had not slept for a year. Was quite self-accusatory; thought she had committed an unpardonable sin and was doomed to hell. She had at times a feeling as if "she is walking straight into eternity." Had a bitter taste in her mouth. She was oriented and alert, but showed impairment of both recent and remote memory. Physical condition satisfactory, showing senile and arteriosclerotic changes.

Comment. This patient experienced recurrent attacks during various epochs of her life. All attacks were of an involutional character. As to diagnosis, senile psychosis of the agitated depressed type could be considered, but of importance, is the mechanism at work.

Group II

Case 10. Female, age 18, Jewish, single. Her father had a psychosis and deserted the family when patient was about ten years old. She felt it keenly at that time. Was an only child and greatly pampered. Her mother expected her to be a great success on the stage, thus stimulating unattainable ambitions. Was attending college and art school. Puberty was delayed and menses were irregular. She grew up emotionally ambivalent, sensitive, with superior cravings. Was sexually cool and narcissistic. Shortly before admission patient had some experience with a woman-friend of a homosexual character. Later was sexually manipulated by a boy of her own age. Following this she complained of feeling tired; was hypersensitive to noise and the hot weather that came on at that time.

Finally became quite agitated; believed that she was about to die and was fearful. In the hospital she presented an anxious, apprehensive attitude. Was afraid of impending danger and had ideas of unreality. Spoke of being "no good," of being contaminated, and expected to be tortured forever. She dreamed of being a lesbian. Felt guilty because of her immoral sexual conduct. According to her, she was supposed to get married but she thought that sexual intercourse with a man was unbearable. She believed that a person ought to remain virginal. Sensorium clear. Physical condition good.

Comment. The case presented a clear state of agitated depression. However, if we should disregard the patient's age, one could not deny that the case is equally clear as one of involutional melancholia. Constitutionally, the patient evidenced hypogenitalism both affective and somatic. She also showed the usual temperamental traits of personality found in cases of involutional psychoses.

Case 11. Female, age 24, German, married. Past life believed uneventful. Described as reserved, conscientious person, well adjusted. Menstrual history negative. Married at 22 and marital adjustment said to be good. However, patient's sexual appetite was greater than her husband's. Had two pregnancies, during which she felt usually well, in spite of the fact that she would have nausea and occaasional syncope. Her psychosis followed closely upon last childbirth. She complained at that time of weakness and pains in her legs. She became more and more irritable and lost sex desire. At about that time her husband lost his job and she began to worry about it. She became more and more concerned about her health, was anxious, apprehensive of impending danger and had numerous somatic complaints. In the hospital she was unchanged. Feared death. Was hypochondriacal and had nihilistic ideas. She felt that her head was getting very big, that her legs were changing, bones softening, et cetera. Sensorium was clear. Physical condition good.

Comment. This was a postpartum psychosis of the mixed type of reaction. The author has discussed the situation in a former study dealing with childbirth psychoses. In this work he showed the possibility of the patient developing involutional-like syndromes following childbirth. Also discussed were the possible psychological and physiological aspects of the situation, upon which there will be further comment. In addition, this patient evidenced metamorphosis and changes of the body-image, as described by von

Angyal. We must say that this symptom is not infrequently observed in postpartum psychoses.

Case 12. Female, age 40, Irish, married. Described as a reserved, industrious person. Menstrual history negative until onset of present difficulties. Marital adjustment poor. Patient considered her husband inferior. Had a desire for children but had none. Five years previous to admission developed a thyroid condition and was operated. Since then began to indulge in liquor to excess. She became restless and sleepless. Had choking sensations and was afraid of death. In the hospital presented an extremely anxious and agitated state. Admitted hallucinations of snakes and animals before admission. She heard derogatory remarks about her. Felt guilty, expected punishment; believed herself doomed to hell. Was hopeless in her outlook. Sensorium was clear. Physical condition good.

Comment. At one time this case was diagnosed alcoholic psychosis, acute hallucinosis, which diagnosis was acceptable. A psychosis dependent upon thyroid dysfunction could be considered. A diagnosis of agitated depression was made, which appeared adequate. Again it would be only necessary to see the patient to make a diagnosis of involutional melancholia. The complex psychosomatic interrelationship, the inseparability of the psychogenic from the somatogenic, and the multiplicity and diversity of causes are evident. For example, after each thyroid operation there would be an increase of libido which would aggravate the patient's hostile attitude toward her husband. She had become interested in another man but her moral code inhibited this interest. She, therefore, projected her guilt feelings upon her husband—a mechanism which might occur in a state of psychosomatic imbalance.

Case 13. Male, age 33, Irish, single. Described as an unstable, seclusive and suspicious man. He received an average education, following which he enlisted in the navy. Remained there for nine years and was honorably discharged at the age of 29. His difficulties began after his discharge. Felt unable to work and was depressed. He began to have peculiar sensations of changing into a woman. He heard people calling him bad names and attempted suicide. In the hospital patient appeared first apprehensive and depressed; later became apathetic. He felt guilty and inferior because of homosexual experiences in the past. Believed he was going to be chopped up. He remained hallucinatory, had ideas of reference. He showed the same mental content for many years. His affective state changed to inadequacy. Sensorium was clear. Physical condition good.

Comment. The diagnosis in this case was schizophrenia. The symptomatology except for affectivity was undoubtedly one of involutional melancholia. Of interest are the feelings of sex reversal, especially in consideration of the patient's affective constellation, homosexual in character.

Case 14. Male, age 25, Greek, single. Described as a normally sociable, emotionally stable and hard-working man, waiter by occupation. His sex-impulse was ambivalent. He tried to compensate his homoerotic drives with an excess of heterosexual contacts with prostitutes. His difficulties were gradual in onset and of considerable duration. He commenced to feel tired and had somatic complaints. Had a peculiar feeling that his lower abdomen and hips increased in size. He finally went into an acute panic, thought the landlord poisoned his soup. In the hospital was depressed and anxious. Had hallucinations of smell for a short time. Smelled "rotten stuff" coming out of his nose and mouth which he identified as similar to the small of a gonorrheal discharge he had many years ago. He believed himself to be filled up with dirt which was being slowly eliminated through his nose and mouth. He firmly believed in his experiences, and had a hopeless outlook. Sensorium clear. Physical condition good, except for chronically-infected tonsils and some sinus trouble.

Comment. The patient showed a mixed type of reaction, also psychopathic and psychoneurotic traits. The mental mechanism pointed to a homoerotic panic. No doubt acute hypogonadism was present. The patient evidenced involutional symptoms, among others the olfactory hallucinations and feelings of sexual metamorphosis.

Group III

Case 15. Male, age 48, mixed race; married. Described as seclusive, having no particular interest, yet a hard-working man. He married at 25 out of his faith. Marital adjustment was poor. Two months before admission he began to feel wrong about his marriage. Thought the wife ought to join his church. Later began to express ideas of reference and persecution. He smelled bad gases which were intended to kill him. In the hospital presented a rather dull appearance; was disconnected in his talk; freely expressed ideas of persecution which were, in the beginning, related to his religious conflict. Later they assumed a bizarre character of sexual nature. Continued for sometime to smell bad odors. Sensorium clear. Physical condition good.

Comment. This was a definite case of schizophrenia. Of interest is the onset which is related to involutional changes and the content pointing to involutional difficulties. Ideas of guilt, sexual misinterpretations, and olfactory hallucinations were at one time in the foreground. Later the patient showed definite dissociation of affect and ideas.

Case 16. Male, age 43, Irish, single. Described as a timid, conscientious and seclusive man. Was intemperate in his habits. Sexually inadequate. Felt inferior with the opposite sex; was afraid of contracting an infection and therefore had no heterosexual contacts. Shortly before admission there was an increase in libido and he had other involutional complaints. Later began to worry about his health. Felt a burning sensation in his body; believed he was full of germs. Was fearful of infecting other members of the family; washed his own dishes, was afraid to touch door knobs, et cetera. Spoke of suicide. Had compulsions, doubts and fears. Sensorium clear. Physical condition good.

Comment. This patient showed a complsive-obsessive syndrome. At the same time there were unmistakable involutional features. He recovered from the latter but continued to express doubts and fears. Constitutionally, the patient showed both affective and somatic hypogenitalism.

Case 17. Female, age 49, Hungarian, married. Described as an unstable person, promiscuous sexually. Marital adjustment was poor. During recent months became increasingly depressed, was self-accusatory, had considerable feelings of guilt and somatic preoccupations. Was depressed and anxious, expecting punishment. Had suicidal tendencies. She was mildly confused as to time relations of recent past. Physically, she showed mild cardiavoscular involvement. Neuropsychiatrically, was a definite case of general paresis.

Comment. This is one of the agitated types of general paresis. The morphological luetic brain changes are believed to be responsible for the neurological findings and sensorial defects. On the other hand, the affective state, ideas of guilt and so forth are probably rooted in involutional changes through which the patient was passing at the time of the release of the psychosis. The situation suggests that the total personality participates in the neuropsychiatric manifestations.

Case 18. Male, age 60, mixed race, single. Early life unknown except that he was pampered by his mother, to whom he remained attached throughout life. He grew up to be a sensitive, stubborn, anxious and unstable person. After schooling he entered an undertaker's business. He later learned to be an embalmer but did not like the work; it would make him feel nauseated. Used alcohol in moderation but had a poor tolerance; would become argumentative following intake of a small quantity of liquor. Sexual impulse ambivalent. At the age of 20 intended to marry a girl neighbor but was not allowed to do so by his mother; he obeyed. At 25 he was attracted by a widow (patient was the undertaker in the case of her husband) who was about 50 years old. He associated with her for several years. At about the age of 30 he contracted syphilis. At approximately the same time had his first mental attack. He had fears; could not look out of a window, had a dread of looking at, or driving over snow (it was winter time). He eventually recovered. Seven years later he had another mental attack which has continued. At that time he felt he could not go on. Was disgusted with "worldly goods" and wanted to become a priest; was emotionally unstable and could not work. This changed to a grandiose state of mind; was boastful, wanted to marry and accomplished the latter in his phantasy. Later he required hospitalization because he became unmanageable. He had since several residences in State hospitals. During his last readmission at the age of 52, patient developed a paranoid trend against another patient, a former clergyman, who was later transferred to another hospital. Our patient continues to express his trend. He complaints that "the other patient" makes him do atrocious things. He "made him attack his sister-in-law in the past." He "makes him perform fellatio on him and swallow the nasty serum." He makes him smell most disagreeable odors. He "changes his taste during a meal so that everything tastes bad." The patient continuously hears his voice calling him all sorts of names, thinking that this is done by telepathy. He expresses death wishes. Is remarkably well preserved considering the nature and the long duration of his illness. There are only minor neurological findings and a minor speech defect.

Comment. This is a case of general paresis. The following are points of interest: First, the patient showed a psychoneurotic reaction before his luetic infection. Second, the original reaction of general paresis shown was of the expansive type, which was maintained for many years, until the patient passed through involution. At that time it changed to a paranoid state. Contemporary with involutional changes, he had a "rush of all ambitions," an increase in libido which released his homoerotic tendencies. Third, it con-

firms the attitude that the causes are multiple, rooted in the entire total personality, and that a "reaction" is inconstant.

Interpretation

In order to facilitate interpretation of the clinical material from the angle of psychosomatic interrelationship, we wish to consider the following known data as well as certain hypotheses relevant to the problem. Attention is therefore called:

1. To embryological findings showing that before the neural plate is differentiated and further growth of the nervous system takes place, there is an advance in differentiation of abdominal organs and glands, such as the gastrointestinal tract, liver, thymus, pituitary, thyroid and other glands. Again, to Langley's findings that the anabolic, parasympathetic system is evolved earlier than the catabolic, sympathetic. This suggests that the central nervous system requires for its proper functioning continuous impregnation with biologicals produced at various levels of the total personality. Psychical activity is constructed and oriented upon the brain. The horizon of the psyche is much wider than neurological mechanisms; however, the psyche requires for its expression a certain neurohumoral equilibrium. Faulty impregnation of the central nervous system with necessary biologicals will result in imbalance, which in its extreme is able even to cause abeyance of biological reflexes. This is confirmed by endocrinological research showing, for example, "erotization" of castrated animals by means of impregnation of the brain with gonadal hormone. It is also well established that psychological factors may cause a disturbance of function.

2. To the suggestion of Zondek that the endocrines, the sympathetic-parasympathetic systems and the electrolytes form a functional unit, known as the vegetative nervous system. The logical conclusion of this will be the observation that endocrine disturbance will show up in sympathetic-parasympathetic imbalance (external phenomena), and changes in electrolytes (internal milieu).

3. To the evidence produced by Loewi, Dale, Cannon and others that nervous impulses have a chemical mediator between neurons as well as between neurons and tissue cells. Considering the influence of psychical states upon the vegetative nervous system, it may

be permissible to think that psychological factors may reach tissues.

4. To the suggestion of W. R. Hess that the parasympathetic system exercises the same protective influence upon the brain as it does upon other organs (concerning the brain, it refers to sleep). The presence of acetylcholine in the brain tissue especially in the basal ganglia may be a confirmatory fact. Considering again the predominant sympathetic excitation at certain periods in the course of our cases, the accompanying insomnia may serve as further confirmation of suppressed vagal activity. The suggestion of Hess points to interaction of the central and vegetative nervous systems which is important in the understanding of the chemical aspects of the excitation process of psychical activity, as will be seen later.

5. To the work of Head and Holmes concerning the role of the thalamus in affectivity as well as the findings of others concerning the hypothalamus and other structures of the diencephalon which are concerned with expression of affectivity. We call attention also to a recent discussion of Papez on the mechanism of emotion. To this end, the relationship of the diencephalon to the pituitary gland and the latter's role as "the leader of the endocrine orchestra," as put by Langdon-Brown, is of obvious importance in evaluation of external manifestations.

6. To the work of Coghill concerning behavior. This author pointed out that normal behavior is possible only if there is sovereignty of the total pattern of activity over all partial patterns of activity (compare with Kretschmer's total affectivity). The present writer has reached the same conclusions independently on clinical grounds. We have shown with reference to schizophrenia and manic-depressive psychosis, inclusive of melancholia, that there is faulty integration and evolution of various constituents of total affectivity (expressed differently in each disorder), with a resulting continuous clash between various impulses, as well as between various impulses and total affectivity. This in turn may be considered the biological source of mental conflict. Equilibrium is maintained so long as the "system of defense" of the total personality is able to resist traumata of any kind, be they psychological or physiologi-

cal, internal or external in nature, and thus maintain sovereignty of total affectivity over its constituents (impulses-partial patterns). The system of defense is expressed from simple reflex action to rather complex cellular, humoral and psychical activity. An important factor of the system of defense, on the physiological level, is the reticuloendothelial system (for details see the writer's former work on the subject). On the psychological level, it is the mechanism of repression (unconscious) which we consider to be the supreme mechanism of defense which masters the continuous clash of total affectivity and its components.

7. To the fact that a syndrome is the external exponent of various factors. It consists of a number of external manifestations (symptoms) which have their backgrounds, are rooted in changes of the internal milieu and may undergo progressive evolution. A syndrome refers to the cross section as well as the longitudinal aspect of the difficulty. On the other hand a clinical picture may consist of more than a syndrome.

With the above in mind we shall proceed to account for the involutional syndrome. As stated, we have to investigate its background, the changes of the internal milieu, and the external manifestations. In following up the development of the latter, we find that certain manifestations belong to a prodromal stage while others form the symptoms proper, as listed below.

Analysis of the external manifestations of cases of all three groups shows that there are certain symptoms which are common to all cases of all groups. However, it must be borne in mind that certain of the manifestations may be present in some cases only temporarily. For example, in cases of schizophrenia which takes onset at involution, the familiar affect of involution will be manifested only for a short time, and may even escape notice, changing rapidly to the schizophrenic variety. The requirement, therefore, is that the symptoms in question manifest themselves throughout the course with only such variations as may be accounted for by the evolution of a symptom, as will be shown later. If this be possible, then we may conclude that there is also a common underlying factor for the common mental phenomena, the nature of which shall be seen when discussing the background.

The involutional syndrome may be thus outlined:

- The background
- Changes of the internal milieu
- Prodromal stage
- The syndrome proper
  - changes of affectivity
  - changes in the motor field
  - mental content
    - guilt and self-accusation
    - anxious expectations
    - rejection of valued relations
    - obsessions and paranoid trends
    - hypochondriasis
    - nihilistic ideas
    - unreality
    - metamorphosis
    - gerocomism
    - death wishes
    - hallucinations of smell

The background

This is considered to be the total personality, consisting in turn of "constitution" and "experience" which are closely interwoven. We find that psychosomatic hypogenitalism, of greater or lesser degree, is a striking constitutional factor present in all our cases and may, therefore, be considered to be the common underlying factor for certain mental manifestations. Another prominent factor present in about 75 per cent of the cases is weakness of the social impulse. In about 60 per cent of patients there was conspicuous weakness or absence of the parental impulse. There is considerable psychic elaboration of the stated inadequacies, which results in selective affectivity, often expressed in exaggeration of such traits as conscientiousness, responsibility and so forth. On the other hand, shyness seems to mask a strong impulseness which is frequently in discord with the affective constellation of the person. Another peculiarity of the organization of total affectivity in our cases is the strength of expression of the so-called "psychical after-effect." The latter we understand in the sense of Wiersma, who defines it as the expression of constancy and duration of affections and attachments to old memories, habits and so forth. The

psychical after-effect is especially strongly represented in the involutional cases. Here we may confirm the observation of Farrar and Franks, namely that constitutional factors are manifested during involution in an exaggerated form.

Changes of the internal milieu

This refers to changes instigated by the functional unit of the vegetative nervous system. We shall take up first the endocrines. Since the pituitary is considered the master gland, let us begin with the activity of this gland. It has been fairly well established that the pituitary secretes several hormones, such as the gonadotropic, adrenotropic, thyroidotropic, parathyroidotropic, diabetogenic and lactogenic. While we do not know the exact relationship of these hormones one to the other, as well as to other glands, theories have been postulated. Among others, the following are of interest: Dodds states that the pituitary secretes only two sets of hormones, acceleratory and inhibitory in character. This he feels is confirmed by the difference in staining of pituitary cells (chromophile and chromophobe). It seems obvious, however, that we could not form conclusions concerning dynamic properties of hormones from pathological findings. Moreover, we do not believe that excitation and inhibition are due to action of different cells, but think that they are aspects of one and the same process. Contrary to this theory, there is the hypothesis of Collip concerning antihormones. This theory is very complicated and is apparently rightfully doubted by such authorities as Langdon-Brown. In fact, there is the interesting work of Gordon, et al, which seems to show that what is believed to be an action of antihormones, is probably the product of activity of the reticulo-endothelial system.

It seems more adequate to examine the relationship of various hormones from the angle of "synergy" and "receptivity." The writer would like to think that the harmonious integration of the individual depends upon a number of factors which promote synergy of the pituitary hormones and their receptivity by other glands. Excess of a pituitariotropic hormone and lack of proper receptivity in other glands (irrespective of cause) will produce disharmony. It is suggestive that the variations in the stated mechanism may be responsible for the enormous varieties or blends of

constitutional traits and inadequacies as described by Kretschmer and others.

In involution, due to gonadal changes, there can be no receptivity of the gonadotropic hormone, for which reason it is found in the urine and blood. According to Fluhmann, it has been observed in the blood of individuals of 90 years. For the same reason it may also be observed in states of artificial menopause and in certain noninvolutional states, as shown by Saethre. We do not know of all the changes that such "untied" hormones may cause. Still in view of the "synergism" and "receptivity" it is evident that during involution not only do we deal with gonadal disturbance but also there is repercussion in other glands with a resulting polyglandual dysfunction.

The polyglandular dysfunction manifests itself in disurbance of various aspects of metabolism. We find in certain cases hyperglycemia and hypercholesterolemia. There is also disturbance of the level of the blood calcium. The latter points to parathyroid dysfunction. Concerning the former, it has been shown by Houssay and others, that the pituitary and adrenals are instrumental in carbohydrate and cholesterol metabolism. Lockwood has shown clinically the relationship of the stated aspects of metabolism, while Kotschneff and Schlepakoff have shown the same experimentally. The mentioned metabolisms seem to have some relationship to the sexual function, especially since Ruzicka and others have demonstrated that sex hormones derive from cholesterol.

As to the second branch of the vegetative nervous system, the sympathetic-parasympathetic, we have during certain periods of involution a sympatheticotropic predominance which manifests itself in a number of symptoms. These symptoms are the already cited circulatory and thermal changes (in the latter, disturbance of cerebral vegetative nuclei to be considered), hypertension of certain cases, the acidity and constipation as well as the blood picture, and insomnia. The last is due partially to calcium deficiency and partially to psychical factors.

Concerning the third branch, the electrolytes, I wish to quote Burridge. According to him tissues are colloidal systems which possess two sources of energy. The interaction of the sources gives the excitation process, which in turn evokes the response of

the organ. Responsiveness undergoes augmentation and diminution of activity. This may be effected by internal activation of the mind (idea) or by nerve impulses from sense organs (in my opinion also by changes of the internal milieu of various causation). Burridge denotes the one form of energy with the letter *H*, which is mediated by electrolytes, and the other by the letter *L*, which is mediated by colloidal aggregations. *L* provides data for sensation, and *H* provides data for consciousness of such sensations. Both sources of energy work synergically. The vagus decreases the ionic element. The sympathicus increases the part of colloidal aggregation. Another item of importance is that an organ has a limited amount of responsiveness which capacity he denotes with the letter *T*, and offers a formula $H+L=T$. The more of *H*, the less of *L*. *H* and *L* may be maladjusted; again the two sources of energy may surpass the capacity of the organ. This will reflect upon the excitation process and consequently upon consciousness. (Unconsciousness, convulsions.)

In the light of the above, a sensation is an appreciation of augmentation of the activity of a rhythmical organ. There are two types of augmentation—the "rapid" and the "hysteresial." A drug, for instance like alcohol, will reduce the part of *H* and increase the part of *L*. Hormones also affect *H* and *L*. For example, hyperthyroidism quickens cerebration, while hypothyroidism produces the opposite. It is noteworthy that strongly and uniformly working gonads will influence behavior less than will those weaker in activity. Here evidently the factor of psychic elaboration plays a role.

Prodromal stage.

This is of variable duration and is characterized by feelings of fatigue and inadequacy, which may progress to ideas of insufficiency. Formerly we looked for causes of fatigue in the periphery, namely in muscular contractibility. Inhibitory activity, toxins and excess consumption of glycogen were also considered as causes. The enumerated factors may be present in our cases; if so, they are regarded as contributory and aggravating agents. At the present time we consider fatigue to be an neural event. L. R. Müller states that the feeling of tiredness is due to electrolytic splitting

and increased permeability of the cell membrances which permits extravasation of calcium, potassium and magnesium cations in the lymph stream. This causes lowering of the irritability of nerve cells and results in decrease of the psychic energy. In our cases, the relationship of psychical factors to the vegetative nervous system ought to be considered. The feeling of fatigue is akin to feelings of hunger or thirst, which are warnings of certain needs of the organism. They subside when adequate relief measures are administered. As far as fatigue goes, if not relieved by physical and mental rest, it may lead to exhaustion. It is noteworthy that fatigue may, at times, be unaccompanied by a feeling of tiredness. This occurs when a strong affective state entirely dominates consciousness. The situation is obviously dangerous and, therefore, has to be taken care of, since otherwise the patient may succumb to exhaustion.

The syndrome proper.

Changes of affectivity. Following the prodromal stage, we notice changes in affectivity which are commonly described as a state of melancholia. The latter may be accepted only with the understanding that we deal here with a rather complex affect. It comprises the past and the future and has several constituents. There is sorrow to the point of despair and hopelessness, apprehension (to be differentiated from fear) and anxiety. Moreover, there is "remorseful regret" and nostalgia. The inadequacy of this definition is appreciated but it may be accepted for the want of better knowledge of the nature of affectivity. Melancholia may progress to apathy and stupor and again revert to the former. The question arises whether the affective changes are primary or secondary. For the present it seems best to assume a neutral attitude towards the question. Anxiety is considered the most striking affect which we shall, therefore, discuss.

According to Freud the problem of anxiety is not as yet solved; still, he reaches the following conclusions. Freud considers anxiety as an unpleasant affect, a signal of danger, a reaction to fear of castration or fear of loss of a love object. With reference to chronology of experiences, Freud thinks that "birth trauma" is a similar event—if the latter is correct, any anticipation of a new and

unknown situation will cause anxiety and apprehension which concomitantly will set up psychosomatic means of defense. For certain individuals involution may be such a situation. This may be also true from another angle. Involution, especially in the female, may be interpreted as cessation of the woman's most vital function which is symbolically equivalent to "sexual death." Consequently, there will be fear of loss of a love object. Again, "sexual death" in the form of the ovarian changes may be thought of as castration. The unconscious perception of the "sexual death" will result not only in anxiety but also in apprehension. In connection with the latter, the following observations are of interest. Shakespeare remarked "the sense of death is apprehension," Rousseau observed that those who claim not to fear death are liars, and Voltaire identified the cessation of ability to love and to be loved with a "torturous double-death."

It may be speculated that at the time of involution, the individual as it were refused to go into another "latency period," never having fully enjoyed the function of sex (our cases are evidently sexually inadequate). This may also result in anxious apprehension. The validity of this speculation may be seen in the observation that during involution certain personality traits, such as meticulosity (which according to psychoanalysis belongs to the latency period) become rather pronounced.

The physiological interpretation of anxiety, from the psychosomatic angle, is facilitated by the psychological consideration of anxiety as a signal of danger. In fact we observe in toxic, infectious conditions manifestations of the sympathicoadrenal system which are interpreted as manifestations of defense against danger. Since the sympathetic system innervates also the thyroid gland, the latter will participate in the clinical symptoms. In connection with this the following opinions are of interest. W. A. White states that fear and apprehension are common symptoms of exophthalmic goitre. N. D. C. Lewis observes that all symptoms of hyperthyroidism are exact duplications of fear. Ingham and Nielson consider fear and apprehension to be signs of thyrotoxicosis even in the absence of an enlarged thyroid and ophthalmologic signs. Of interest is also the observation that anxiety dreams may precede an outbreak of an infectious condition. Reich sees anxiety as

the result of prolonged sexual excitation without relief. He thinks that the hormones and other metabolic elements which are catabolized in the normal course of the sexual act, have a toxic effect upon the vegetative system causing continuous excitation. Anxiety is thus the psychical correlate of the vegetative excitation. In other words anxiety may be regarded as the psychical appreciation of physiological changes rooted in a struggle for equilibrium of the upset vegetative sphere. It may be further regarded as is the feeling of fatigue, namely as a warning. In the sense of Burridge, we have here a bad composition of the excitation process in the form of maladjustment of the forces *H* and *L,* which is shown in mental unrest and indecision.

The described changes of affectivity are characteristic of the involutional period and offer one of the cardinal differential points.

Changes in the motor field. Agitation is the motor accompaniment of anxiety. Its degree of expression depends upon the amount of anxiety present. It manifests itself in degree from uneasiness and mild restlessness to the well-known involuntary motor unrest which is a component of the picture of despair. Agitation may change into inactivity to the point of immobility. In such instances the affect displayed is one of apathy. The affect is so to say "frozen," as is the ideation. In this setting absurd ideas may be present but they are without affect and the patient does not react to them, but expresses them as a matter of course.

Mental content. It is a common observation that when depression sets in, there is a reversion to the past, and ideas of guilt will promptly follow. Freud distinguishes two kinds of guilt. The one is social fear, the other, pangs of conscience. It is the fear of loss of the love object or valued relations. The aim of reconciliation manifests itself in craving for punishment (expectations of impending danger, self-mutilation, refusal of food, suicide), and in self-blame.

Two forms of self-accusation, the direct and the indirect are distinguished. The former manifests itself in ideas of unworthiness ("the greatest sinner," et cetera). There may be a self-blame for causing the unhappiness of others, and craving for sacrifice. This may be called "altruistic" self-accusation. The egotistic, or indirect, will refer to blame by others. It may progress to the schizo-

phrenic type of projection. It is essential, therefore, to differentiate the cyclothymic from the schizophrenic type of projection, in the way that the former applies to "guilty victims" as expressed by Ballet, quoted by A. J. Lewis, while in the latter case, the patient believed himself "innocent."

The indirect self-accusation may further manifest itself in rejection of formerly valued relations. It is usually husband, wife or parents. It may progress to a definite circumscribed trend. In the case of husband and wife it is usually rooted in sexual maladjustment or struggle for dominance. It may be constitutionally determined, psychologically conditioned and precipitated by endocrine changes; in the woman it may be due to "virilization" while going through involutional changes or to the release of dormant affective constellations by the same cause; in the man, it is primarily psychologically conditioned on a constitutional basis.

Physiologically, in the sense of Burridge, we deal in depression with a slowing of the rhythm of central neurons. This perhaps causes the person to revert to the past. A former "misdeed" will become a source of terror.

Next, the problem of hypochondriasis. Perhaps the best definition of the latter is an anxious preoccupation with a bodily complaint for which known means of investigation are unable to establish a basis. We must bear in mind, however, that from the standpoint of "functional pathology," from the angle of chemical mediation of nerve impulses as discussed, tissue changes in such cases may be present. At any rate, the preoccupation and the magnitude of the trouble, as it appears to the patient, may warrant the term hypochondriasis. The latter may have variable roots. It may be the physiological accompaniment of anxiety. It may be an equivalent of anxiety. It may also be a conversion of affectivity.

As far as evolution of a symptom is concerned, hypochondriasis is manifested from its mildest form, as doubt of one's health, to the belief that one is subject to an incurable disease. With changes of affect from anxiety to apathy, somatic preoccupation may become for an indefinite time an obsession or a delusion, or it may swing to the opposite, the denial of the very existence of a somatic level which was formerly the center of attention. In other words the

patient will express nihilistic ideas. We regard the latter as far as they refer to the soma, from an evolutionary vantage point, as the opposite of hypochondriasis, the negative pole. The symptom of loss of feelings is believed to be of the same origin.

As an accompaniment or equivalent of anxiety, we may identify the symptoms with sympathicotropic action upon various constitutional levels which are excellently described by Euzière and Margarot. The author has personally observed in patients who came for abdominal surgery, considerable change in the smaller vessels of the viscera. The observed ischemia of various organs no doubt could give rise to certain somatic sensation, their elaboration depending upon affectivity.

As to further interpretation, hypochondriasis may be regarded in certain cases as an exaggeration of original personality traits. Such individuals are primarily overconcerned about their health. In certain patients somatic complaints may be linked with ideas of guilt. In others Freud's postulate concerning diffusion of "dammed-up" libido through various organs may be accepted, but if so, the correction of Reich seems more adequate.

According to Burridge, the physiological mechanism lies in changes of colloidal aggregation and electrolytes. The sympathetic excitation brings about augmentation of colloidal aggregation, thus increasing the appreciation of sensation. After sympathicotropic action subsides, there will be a decrease in appreciation of sensation. It is suggestive, that if the changes be abrupt such decrease may give rise to ideas of negation inclusive of loss of feeling.

The symptoms of unreality or depersonalization are well known. They occur in many forms of mental disorder. The symptoms manifest themselves as a disturbance in feeling, as a disturbance of arrangement in space, and as a disturbance in perception of one's body-image. Concerning the mechanism, Schilder assumes that in such cases the person does not dare to place his libido either within himself or in the environment. Nunberg, quoted by Yaskin, endeavors to trace the disorder to unsuccessful sublimation of sexual pleasures or of fright in childhood. On the other hand, Griesinger, also quoted by Yaskin, believed that the disorder is due to disturbance of affectivity. Birnbaum, quoted by A. J. Lewis, speaks of

splitting of affective elements, and Rosenfeld also quoted by A. J. Lewis, emphasized the loss of the totality function in unreality. Gestalt psychology seems also to refer the difficulty to affectivity.

Attention is called here to certain physiological aspects of the problem. Schilder speaks of the opticovestibular element of the phenomenon. Von Angyal described the parieto-occipital aspect of metamorphosis. It is further known that unreality may be observed in the so-called uncinate fits of variable etiology. The writer has quoted formerly a case which showed a feeling of lightness and a feeling of floating in the air in which a dorsal root ganglion syndrome was suspected. It is the author's further impression that these cases show considerable vulnerability of the vegetative nervous system.

Our patients have shown, besides the quoted forms of unreality, a form of metamorphosis for which the term sex-reversal is preferable. The opinions of Woolard and Langdon-Brown on the subject are of interest. It is shown that the ovaries are bisexual, while the testes are monosexual. The former have rudimentary masculine tissue. Sex-reversal is caused by abnormal growth of mesonephric tissue. In the female therefore, virilization may be caused by atrophy of the ovarian tissue which will give prominence to the rudimentary masculine tissue of the ovary. Such may also be due to overactivity of the adrenals which contain mesonephric tissue. The psychological constellation of the person will play an important role. Since the testes are monosexual, we are told that sex-reversal in the male will be psychological. However, we could not subscribe fully to the latter because of frequent manifestations of female secondary characteristics in such males. A constitutional factor must be also in operation. Here, we may mention the "feminoid" origin of the prostate gland. While this gland may play an important role, its function is still rather obscure.

Considering the above, it is proposed to regard unreality in all its forms, as a psychic appreciation of physiological changes rooted in disturbance of the unity of function of certain personality levels, among which vestibular, optic, thalamic, hypothalamic, olfactory, gustatory and tactile factors are prominent. The psychological element may give rise to the symptoms, and will shape them.

Death wishes are frequently observed in these patients. So far as is applicable to our cases, there are two major forms of death wishes (not to be confused with the motivation or the problem of suicide as a whole). They are masterfully translated into music. We have on the one hand, the cry of Wotan longing for death, as expressed by Wagner; and on the other, the composition "Sweeth Death, Come," by Bach. The latter applies to the joyous calmness of fulfillment of one's destiny, or to a state when "all passion is spent." It is only rarely observed in our cases, namely when exhaustion sets in. It is the former, the outcry of gloom, that we usually have before us. Tolstoy, who at the age of 50 years apparently went through involutional changes, masterfully describes the state of his mind tormented by death wishes.

Death wishes may remain as such for an indefinite period of time, or may culminate in suicide. The latter is of obvious interest. In a former study on the subject, the conclusion was presented that the causes for suicide are multiple; that no matter how a given cause for suicide may seem plausible for a given case, no general laws can be established. It seems that of all theories on suicide, be they physiological, psychological, sociological or biological, psychoanalysis has contributed most to advance our understanding of the problem. However, while the role of the unconscious is considered paramount, conscious elements ought not to be ignored. It is true that certain conscious motivation is rather trivial and is apparently inadequate to account for the act. It is also true that conscious motives may be often only disguised unconscious wishes. Still there are conscious attitudes which cannot be explained on the mentioned lines. Such conscious motives gain particular significance in the light of certain physiological phenomena discussed below.

Let us therefore, examine both conscious and unconscious motives. An outstanding motive on the conscious level, in our cases is that of unworthiness. It may develop entirely in conscious attitudes. In such cases the conscious motive is rooted in conscious feeling of guilt, referable to sexual, religious and social "misdeeds" in the past life. Unconscious difficulties may contribute to the same. The unconscious guilt is of an entirely different order. The "misdeeds" are unacceptable wishes for the person. Out-

standing are murderous wishes and forbidden sexual phantasies which may be projected in delusions and hallucinations, or otherwise ventilated. To the unconscious order belong also death wishes and suicide of a symbolic character, such as wishes for sexual union with the deceased love object, or symbolization of personal sexual death. Again depending upon certain religious beliefs it may symbolize a desire for perpetual suffering ("hell-fire").

The mentioned motives are not specific. The same ideas may be met with in patients who do not resort to suicide. Still, certain cases may confirm the psychoanalytic theory that suicide is based on a special identification mechanism with persons previously loved and later hated whose death is sought. In other cases, we find confirmation of the idea expressed by Schmideberg that suicide is the result of fear of death or fear of life. The author referred to the same in speaking of "fear of the unknown."

It is suggested that before one speaks of the mechanism of suicide, both the conscious and unconscious motivation as well as the physiological aspects ought to be taken into consideration. The physiological concept of a "dominant" excitation as demonstrated by Ukhtomsky, quoted and supported by Bechterew, and which it is possible to demonstrate in different aspects of daily life, may throw some light upon the problem. This situation has been discussed by the writer in a previous study on suicide. Here it will suffice to state that a "dominant" excitation once present in the nervous system will block all other pathways until it is discharged. It is suggestive that physiological changes of involution may impair the system of defense, which in turn facilitates the rise of a "dominant." As it were, the "dominant" occupies the entire horizon of consciousness. There is no compromise nor compensation possible. Therefore, under given circumstances, action must follow (suicide). If so, the question arises why only a few cases attempt suicide, especially since we are warned that in involutional melancholia suicide is to be expected in view of the fact that agitation may facilitate this, contrary to depression with retardation.

There may be two reasons why few of these patients attempt suicide. First, it is anxiety which is the basis of agitation that often prevents suicide, for the reason that, as Janet already pointed out, anxiety is a fear of action. There is flight from ac-

tion. An attempt at action will be checked by another attempt of opposite action, and this will cause failure of action. Second, a great number of patients of this type who entertain death wishes rooted in guilt feelings, if not of the type to desire perpetual suffering "hereafter" as mentioned, wish to suffer perpetually all through life. This prevents the development of a "dominant" which would result in action. A good illustration of this is the case of a patient who during his acute stage of illness swallowed a rosary with suicidal intent. The rosary was subsequently eliminated. However, the patient claimed that only the beads are gone, but the cross is within him and will always be there. He knew it could not be seen with X-rays, but it was there just the same. He spoke of being unable to die, that his stomach had a double lining, et cetera. The mechanism seems clear. This patient's death wishes changed to the idea of inability to die, which is often the result of a frustrated suicidal move. In fact, they desire perpetual suffering alive. In this case, the cross obviously symbolizes eternal suffering.

Hallucinations of smell were discussed in a separate study. Here it may suffice to say that a comparative study of a number of case of various mental disorders has indicated that the hallucinations in question may have a common underlying factor, namely acute hypogonadism. No matter what the diagnosis of an investigated case, the clinical syndrome showed a definite involutional coloring.

Two forms of hallucinations of smell may be distinguished. One is referable to the person himself (*I* mell bad), which is akin to direct self-accusation. The second is akin to indirect self-accusation (*They* blame *me*—smell caused by others). The hallucinations were further interpreted as manifestations of psychical activity signifying choice or refusal, and as symbols for danger and attraction. Depending upon the one or the other, the smell may be unpleasant or pleasant. In our cases the smell was uniformly of unpleasant character, thus signifying a defense against, or rejection of, an unacceptable situation. They occur in a setting of sexual crisis. Physiologically, we might confirm the findings of Wood concerning the relation of cranial symptoms to gonadal disorder. The further relationship is rather complex since olfactory tracts have connections with thalamic, hypothalamic, optic, gustatory,

tactile and other tracts, as well as with the expression of affectivity. For details the reader is referred to the mentioned study.

Treatment

Therapy of a given condition depends upon the extent of our knowledge of, and our attitude toward it, as well as personal experience with one or another method of treatment of the condition. Generally speaking, therapy always was, still is, and probably always will be, a combination of art and science. It becomes apparent that the art of treatment may be identified with psychotherapy, since at the present we are aware that there is no treatment of human ills of any kind without psychotherapy. With reference to mental disorder psychotherapy, as it may be expected, plays a predominant role.

We are aware of the beneficial effect of general hospital care inclusive of psychotherapy and its adjuncts, such as occupational therapy, hydrotherapy, discipline and hygienic measures. This, together with the removal of a patient from the home, and affording him a minimum of effort, will allow the patient's redistribution of energy, and result eventually in his recovery. We are also aware of the prolonged course required for such recovery. But above all, we know that this group of patients are largely inaccessible for psychotherapy for which reason we must look for additional remedies.

It seems that it is beneficial to combine the stated therapy with administration of estrogenic substances. Novak, while considering treatment of the menopause as psychical and general, recommends estrogenic preparations. Donald strives to correct the impression that estrogenic therapy is limited to a short period after the menopause. He calls attention to the fact that a delayed or late climacteric is not rare and states that much suffering may be spared by a wider appreciation of estrogenic therapy. This is in accord with the writer's experience. Ault, Hoctor, and Werner treated with Theelin a group comprised of patients with involutional melancholia, schizophrenia and arteriosclerosis presenting involutional symptoms, with apparent good results. Little and Cameron recommend Theelin for the relief of menopausal anxiety.

As to dosage, the author agrees with Smith that the matter of receptivity plays an important role which renders the case individual. Certain therapists use rather large doses. Novak recommends smaller doses with which the writer agrees. Werner, et al, produced experimental evidence that 5,000 international units of Theelin produce a full follicular phase in vaginal smears, which may serve as a guide.

We have treated 20 female cases of involutional melancholia and 10 cases of schizophrenia with involutional symptoms. While the treatment is individual, the following procedure has been adopted. Upon admission to the ward the patient is encouraged that she is to receive a course of special treatment. She was placed on phenobarbital and bromides in doses depending upon the severity of the anxiety. It was continuously requested of the patient, if unresponsive, to occupy herself. Along with this, Theelin is started in doses of 100 international units in aqueous solution by hypodermic, every second day until improvement is shown. If necessary the dosage would be increased. In the schizophrenics 1,000 international units in oil are given intramuscularly, once a week. No cases received above 5,000 international units of Theelin. Treatment does not need to be continuous, but administered according to symptoms shown. A return of the usual physiological symptoms, or of anxiety may serve as a guide. A very common recurrence in our group was uneasiness and apprehension which promptly subsided by renewal of treatment. Along with improvement psychotherapeutic talks on simple lines were given which are believed helpful.

There were 70 per cent recoveries of the melancholia group, with a further 20 per cent of improvements; 10 per cent remained unimproved. A period of four months was established as a standard time for comparison. Of the schizophrenic group, there were 50 per cent recoveries and 20 per cent improvements for the same period of time. The cases were followed for at least one year after leaving the hospital.

In this discussion of therapy, a few words are necessary regarding surgical procedures in involutional cases. Except for emergencies, extreme caution must be exercised in regard to operations, especially when they involve the genital and anal spheres, or mam-

mary and prostate glands. McCarthy in a recent paper calls attention to the effect of the hypersensitive verumontanum upon the psyche, and to the delicate manner of treatment it requires. Taylor, who "operated on many varicoceles for a malady that was above the neck," also calls attention to emotional disturbances which surgery of the genital region may provoke. Our experience showed that the mentioned kind of operations may severely aggravate the patients' condition by giving them additional food for their delusions, and creating other false beliefs, as well as aggravate the course by physiological complication as the result of surgery. It is, therefore, the writer's opinion that no operation besides emergencies ought to be done without psychiatric consultation. If an operation has to be done, proper psychotherapy ought to be given, and proper preparation on the somatic level is necessary.

The following cases illustrate the type and manner of therapy given.

Case 19. Female, age 39, mixed race, married. Described as a reserved, religious and conscientious person of good intelligence and self-supporting until marriage 14 years previous to admission. She had two children during early years of marriage. Marital adjustment was poor. Husband did not care for sex, had no desire for children, while patient had a fairly strong appetite. Because of religious beliefs of both partners, they decided to abstain from sex relations and practised abstinence for some seven years. The present illness was of about one year duration. There was an increase in libido, she felt nervous, tired and became emotionally unstable. A physician advised that the couple resume sexual relations which they did but it made matters worse. She became quite depressed, developed idas of infidelity, was anxious and agitated. She thought her husband was going to desert her and kidnap the children. In a state of acute anxiety, it appeared to her one day that her husband committed suicide by hanging in the cellar of the house, and she rushed there with a knife to cut the rope. She was then hospitalized. Improved, paroled and returned. Was subsequently paroled twice with same results. Her husband became quite disappointed and refused to take the patient home when again notified that she had improved.

Comment. The case is quoted as an example of psychotherapy. This patient was originally diagnosed as one of manic-depressive psychosis. However, when she came under the writer's care, the

mental manifestations suggested an involutional basis. Questioning brought out confirmation in the form that the patient was subject to physiological symptoms of the menopause which were ignored before. The situation was a revelation to both the patient and her husband. Since the patient was accessible psychotherapeutic talks were given with satisfactory results. She made a good adjustment, was paroled and there were no relapses. It is of importance in such cases to work also with husband. This case shows the possibility of arriving at physiological conclusions by proper evaluation of mental phenomena.

Case 20. Female, age 57, German, married. Described as an unstable, ambitious and overactive person of average intelligence. Came to the U. S. in order to escape from her home environment which was poor in many respects. Here she felt lonesome, friendless and insecure, for which reason she married. Marital adjustment was poor. Her husband made her work hard; she was frustrated in her desire to have children. Menopause several years before present admission. At that time she developed an acute sense of insecurity which she tried to remedy by means of spiritualism. Was disappointed, became depressed and was hospitalized. Improved, was paroled and discharged but was never well since. Shortly before present admission, she witnessed a man suffering a stroke. She developed an acute fear of dying, became extremely anxious, apprehensive, agitated and hypochondriacal. Sensorium was clear. Physical condition good.

Comment. This is a typical case of involutional melancholia of considerable duration with acute exacerbations. She was treated chiefly with Theelin; received 100 international units in aqueous solution by hypodermic, every second day. Altogether 1,200 units were given. The course was repeated about six months later while out of the hospital. The case was followed for three years. She remained in satisfactory condition.

Case 21. Female, age 44, Jewish, married. Described as a seclusive, suspicious and unstable person. She married at 28 in order to have a home. Sexually frigid, marital adjustment was poor. Had one child after four years of married life who was mentally defective. In subsequent years had several abortions. After childbirth was overconcerned about her child and expressed ideas of reference. She was said to have recovered. Two years later expressed ideas of reference and persecution for some time. Was treated endocrinologically and again recovered. Three years later showed a similar projection mechanism. In addition, she rejected her husband and

had hallucinations of smell. Since then remained unstable, nervous and restless. Was especially annoyed by sexual intercourse. The present upset was rather acute. She expressed ideas of homicide directed against her husband and sister; she suspected them to be intimate. Had furthermore, ideas of poisoning and influence. In the hospital evidenced the same ideas, and until treatment was given, was quite difficult to manage. Her sensorium was clear and physical condition good.

Comment. The diagnosis in this case was schizophrenia. She evidenced, in our opinion, definite involutional features on the mental level, which opinion was confirmed by physiological manifestations, such as "hot flashes," sweating, et cetera. She was therefore given Theelin. She received 1,000 international units in oil, intramuscularly, once a week, through a course of 5,000 units. The patient was able to leave the hospital within three months and was discharged after a year on parole. It is of special interest that this patient later required another state hospital residence. She received at that time no treatment other than general hospital care, and was released only after 14 months residence.

Conclusions

The present investigation seems to show that a comparative study may facilitate crystallization of a clinical syndrome. Moreover, it may establish common underlying factors for certain mental manifestations which in turn may contribute to the understanding of psychosomatic interrelationships.

The writer recommends the term involution in preference to menopause, climacteric, or critical age because of the apparent advantages, such as its biological accuracy and its applicability to both sexes, as well as to various epochs of the individual's life.

Involution may produce a number of external manifestations (symptoms) which tend to group themselves significantly and to form a clinical syndrome which may be called *the involutional (mental) syndrome.* It consists of the characteristic affectivity as described, and any combination of other enumerated symptoms. Such differentiation enables one to distinguish the syndrome from involutional symptoms which may occur when the onset of another mental disorder is related to involution as a setting, or to complicate an already existing mental condition. The latter may be often

observed among old hospital residents at the time when they are entering involution. Several varieties of the involutional syndrome at different epochs of life have been cited.

Symptoms should be evaluated from the angle of their evolution, which will promote better understanding, and prevent misinterpretation of a given symptom as having different meanings because of the manifested variety. For instance, self-accusation may evolve into rejection, projection and so forth. Hypochondriasis may evolve into ideas of negation. Fatigue may give rise to ideas of insufficiency. When properly understood mental phenomena may give cues to physiological changes which may have been overlooked (cases 20 and 21).

This investigation supports the view that there is no essential difference between involutional melancholia and agitated depression. Considering that our comparative study showed that we have a common underlying factor for certain mental manifestations, and the fact that it is possible at times to derive physiological convulsions on the basis of mental manifestation, the writer believes that we deal in involutional melancholia and agitated depression with similar physiological states, in the sense that we have in younger people a state of acute hypogonadism akin to involution. The fact that the external manifestations in these and similar conditions are somewhat differently expressed, lies (1) in the degree of expression of the physiological changes which are more pronounced at the menopause than in early life, (2) in the workings of the system of defense of the total personality, (3) in the difference of experiences in the past life of the person, which in turn depends, among other factors upon the age of the individual, and the psychology of youth, middle and advanced age. This attitude enables one also to understand the recurrences which are inherent in the possibility of psychological and physiological exacerbations and the individual's resources of compensation. While involution is usually earlier in the female than in the male, hospital cases show quite frequently the occurrence of involution in both sexes in the early years of the fifth decade.

The treatment of choice in involutional psychoses is the outlined psychosomatic therapy. It works satisfactorily also in cases which show involutional symptoms. An outstanding factor of the treat-

ment is the fact that it shortens considerably an attack. However, no standardization of treatment is possible, and the therapy is individual. Considering that in certain hospitals cases of involutional psychoses (exclusive of those with involutional symptoms) form about 6 per cent of admissions, it is evident that the stated therapy will be of advantage not only to the patient, but will benefit considerably hospital economics.

Manhattan State Hospital
Ward's Island
New York, N. Y.

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PELLAGRA: REPORT OF TWO CASES IN PSYCHOTIC PATIENTS

BY ALMA FREEMAN, M. D.

Pellagra was first described in 1762, by Casal, who named the disease "mal de la rosa." History indicates that the disease was endemic in Spain as early as 1735. In 1771 Frapolli described a similar condition existing in Italy and applied the name of pellagra to this disease. At later periods the disorder was found to be fairly prevalent in other European countries and was generally recognized in the United States in 1907-8. Sporadic cases were reported from New York and Massachusetts as early as 1864, but it is not known how long pellagra had existed in this country before it was generally recognized.

Since the early description of pellagra there has been great interest in its etiology and treatment. The theories regarding etiology have been many and varied. The consensus of present-day opinion, however, is that pellagra is a deficiency disease attributed to faulty or unbalanced diet. Goldberger and his colleagues in their noteworthy investigations have shown the relationship of the deficiency of the P-P (pellagra preventive) factor to pellagra and this is now generally accepted, as is the relationship of vitamin B to beri beri. The P-P factor has come to be later known as vitamin B2 or G. The theory that the disease is caused by a specific bacterium is still held by some investigators, but so far no one has been able to isolate any specific organism and reproduce the disease.

Pellagra is essentially a seasonal disease, occurring particularly in the spring but it may also occur in autumn. Increased prevalence begins in late winter or early spring, continuing to about the middle of summer with a subsequent pronounced decline. There is also a tendency for the disease to recur in the same individual from year to year. The high incidence of the disorder in southern institutions where the diet consisted largely of cereals, has frequently been noted. Economic conditions and the lack of certain classes of foodstuffs appear to be the dominant factors underlying pellagra prevalence. Food idiosyncrasies and individual dietary eccentricities appear to be responsible for many of the cases seen in the well-to-do and in psychotics. Alcoholism favors the de-

velopment of pellagra probably by producing disturbance of the gastro-intestinal tract and by the decreased ingestion of food in favor of alcoholic fluid intake. The incidence of pellagra is relatively high in children of both sexes between the ages of two and ten years, and women between the ages of 20 and 40 years are much more frequently affected than men of the same age. Children under two years of age seem to be the least susceptible. There is no evidence of heredity or contagion although several members of the same household may suffer from this disease.

The symptomatology which constitutes the diagnostic triad involves the gastrointestinal, nervous and cutaneous systems.

The gastrointestinal symptoms often occur early in the disease. In the mouth there may be loss of taste with sensations of heat. Salivation and stomatitis are common, the mucus membrance is red, and the epithelium may be stripped off and ulcers appear. Anorexia, nausea and vomiting are frequent; there is also diarrhea which is often severe, accompanied by pain, and the stools may be serous or bloody. Diarrhea may alternate with constipation. There is a reduction or absence of hydrochloric acid in the stomach. Due to gastrointestinal symptoms there is often a decided loss of weight and a progressive emaciation.

The nervous and mental symptoms are numerous. One of the first complaints is often of progressive weakness and loss of energy. There may be headache, vertigo, irritability, changes in disposition, insomnia, mental dullness and confusion, altered reflexes, paresthesias, peripheral neuritis, and loss of control of vesical and rectal sphincters. A maniacal excitement with hallucinations, a depression, or dementia may occur.

The cutaneous involvement is manifested by an eruption which begins as an erythema with sharply defined line of demarcation and bilaterally symmetrical distribution. This skin lesion is considered as the most nearly pathognomonic symptom of the disease. The erythema first resembles an ordinary sun burn. Subsequent changes in the affected areas may assume either of two forms, the dry or wet type. In the dry type the skin is dry and rough and begins to desquamate. The presence of more or less pigmentation and keratosis often gives the affected areas a rusty or dirty appearance. The desquamation may proceed and leave the skin a

smooth white or pink, with gradual return to the normal color. In the wet type bullae or blebs form in the erythematous areas and the lesions often become secondarily infected. This type may be accompanied by most severe constitutional disturbances. The eruption may occur on any portion of the body surface but is most frequently seen on exposed skin surfaces, on the backs of hands and forearms, dorsal surfaces of the feet, the lower portion of the legs, the face, neck, and upper sternal region. Other portions of the body, including the genitalia, may be involved. Along with the gastrointestinal, nervous and mental, and cutaneous symptoms there is often associated a slight to moderate degree of anemia.

The disease occurs in two main forms, the one acute, the other chronic and recurring. In the acute form there are marked prostration, fever, severe diarrhea, delirium or stupor and a rapid downward course with death possibly occurring in a few weeks from the onset. In the chronic form the symptoms are not severe but tend to recur each year with each attack leaving the patient in worse condition. There is a tendency to mental deterioration in this type and death usually occurs from exhaustion and cachexia or some intercurrent disease. Cases without the skin lesions but with all other important symptoms—pellagra sine pellagra—have been described.

Pathologically there is nothing characteristic. There may be atrophy of the walls of the intestines and fatty degeneration of the internal organs with alterations in the cord. The lateral columns in the dorsal region and the posterior columns in the cervical and dorsal regions show degenerative changes with a corresponding increase in the neuroglia. Degeneration of the ganglion cells in the anterior horns and of the anterior root fibers has been reported.

The methods of treating pellagra have been many and varied, but the importance of an adequate diet as an essential feature in treatment has long been recognized. Even Casal in 1762 recognized the efficacy of nutritious food in the treatment and in 1866 Roussel, a distinguished French investigator, summed up the information on this point in the following manner: "Without dietetic measures all remedies fail . . ." Adequate diet is the keynote to both prophylactic and therapeutic measures. A diet rich in animal protein food is the essential. Milk, fresh lean meats, eggs, legumes, and

green vegetables taken in proper quantities furnish an adequate diet. Spies recommends supplanting an adequate diet with preferably at least an ounce of dry brewer's yeast, Ventriculin, liver extract or two ounces of wheat germ daily. The wheat germ and yeast have the advantage of being much cheaper than liver extract. If liver extract can be provided the treatment is more successful when its parenteral administration is supplanted by oral administration of large amounts of brewer's yeast or wheat germ. The nutritional diet is given regardless of the severity of the gastrointestinal symptoms, which are not controlled by the usual measures but respond effectively when the nutritional deficiency has been remedied. Hydrochloric acid is given and it may be necessary to prescribe iron to combat the secondary anemia. Arsenic given orally or by injection has been used in treating pellagra. The skin lesions improve when general therapeutic measures are applied and secondary infection is prevented by the use of mild antiseptics locally. Sedation may be required for the mental symptoms.

Case Reports

Case 1. The patient was a single, white female, who was admitted to Brooklyn State Hospital on August 16, 1911, at the age of 24 years in good physical condition. The family history was negative. The patient had always been healthy and was a successful public school teacher until two years prior to her admission, when she became moody over a love affair. She had difficulty in applying herself to her teaching because of this mental state, which persisted for about a year when she attempted suicide by means of gas. A few months later a friend of hers was drowned and she then became noisy, claimed she was dead, imagined she was a "spirit" and expressed ideas that some influence was being exerted upon her.

The psychosis was characterized by auditory hallucinations, persecutory delusions, and an extremely restless, disturbed condition which alternated with short periods of mutism. Mental deterioration became evident. A diagnosis was made of dementia præcox, paranoid type. About five years after admission she was transferred to Kings Park State Hospital where she failed to show any improvement and was returned after a year by transfer to the

State hospital of first admission. The patient showed progressive deterioration and on March 27, 1922, was transferred to Hudson River State Hospital. She was cared for in this hospital for over fourteen years until her death, July 9, 1936. During this entire period she was impulsive in conduct, showed marked mental deterioration, and required spoon feeding. During the last six years of her life, due to her impulsive homicidal tendencies, it was necessary to keep this patient in a room apart from others. From the time of her last admission she ate feces, insects, or any foreign matter which came within her grasp. Due to her resistive attitude satisfactory examinations could not be made, but attempted examinations revealed the presence of myocarditis for the last six years of life.

At the age of 49 and after 24 years of hospitalization she developed a severe diarrhea accompanied by an erythematous condition of her hands and neck which indicated the diagnosis of pellagra. Blood examination showed hemoglobin 75 per cent, erythrocytes 3,550,000, leukocytes 4,800 with polymorphonuclear leukocytes 65 per cent, lymphocytes 34 per cent and large mononuclears 1 per cent. The presence or absence of achlorhydria could not be evaluated in this case due to the patient's resistive and uncooperative attitude. Knee jerks were absent.

Treatment consisted of a diet of fresh lean meat, eggs, milk, orange and tomato juice, Embo and liver extract. Embo, a purified wheat embryo, is a preparation rich in vitamins B, E, A and G. This preparation was given in doses of two ounces daily. A daily intramuscular injection of liver extract prepared from 100 grams of liver was given. In this patient the disease was of the acute type and ran a rapid course. The cutaneous lesions showed desquamation, the diarrhea did not improve, emaciation became quite marked, and the patient died one month from the onset of the pellagrous symptoms. Postmortem examination was refused by relatives.

Case 2. The patient is a married, white female, who was admitted to the Hudson River State Hospital, May 17, 1927 at the age of 30 years. Family history was negative. The patient was described as healthy and normal until six months prior to admission when,

after the death of one of her children, she became depressed, irritable, and agitated. This depressed condition subsided in a few weeks, but two months prior to admission she became overactive, excited, apprehensive and fearful.

On admission physical examination revealed a well-nourished young woman who was overactive, emotional, irritable and assaultive. Hallucinations were denied, sensorium was impaired, and delusions were expressed of attempts to rob her. Due to hypermotor activity the patient required frequent sedation and therapeutic pack treatments. A diagnosis of manic-depressive psychosis, manic type, was made. Her condition improved to such an extent that she was paroled to the custody of her husband six months after admission. She remained at home for almost three months, when her mental condition necessitated her return to the hospital. The patient became pregnant during the parole period. Delivery, about seven months later in the hospital, was normal and there were no complications during the puerperium.

This woman has continued irritable, assaultive, overactive, and shows mental deterioration. She had a good appetite until January, 1931, when she had to be urged to feed herself and a few weeks later it was necessary to spoon feed her. In October, 1931, brown, indurated desquamation and sharply defined skin lesions of hands, forearms, neck, posterior surfaces of knees and buttocks were noted. There was an accompanying diarrhea and stomatitis. The patient had lost 30 pounds in weight during the past year. Deep reflexes were considerably increased. A diagnosis of pellagra was made.

Treatment consisted of dilute hydrochloric acid in doses of 10 drops three times daily, a diet rich in protein and Bemax. The dosage of Bemax was one tablespoonful (15 gms.), equivalent to 700 units of vitamin B, three times daily. Within one and one-half months after treatment was instituted the skin lesions were fading, the diarrhea was subsiding, salivation had ceased and a slight gain in weight had occurred. After two months with this treatment the patient showed no signs of pellagra. Nevertheless the same treatment was continued for a month and a half. There was a progressive gain in weight during the succeeding months until normal weight was reached. There has been no recurrence of any symp-

toms of pellagra. The patient's appetite is good, although at times she still requires spoon feeding due to her mental condition, which has remained unimproved.

Summary and Conclusions

1. Two cases of pellagra occurring in psychotic patients after 24 and 4 years of hospitalization, respectively, are reported.

2. Both cases developed in patients who exhibited faulty habits of eating.

3. One patient responded favorably to the administration of a high vitamin diet and hydrochloric acid.

4. The other patient, in whom pellagra was complicated by myocarditis, did not respond to the administration of a high vitamin diet plus daily intramuscular injections of liver extract. Death resulted one month after the onset of symptoms.

5. The psychosis in the patient who responded favorably was unaltered by the intercurrent disease of pellagra.

6. It would seem advisable to regard all mental hospital patients who show faulty eating habits or refuse food as potential pellagrins.

Hudson River State Hospital,
Poughkeepsie, N. Y.

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PROSTIGMIN TREATMENT OF MYASTHENIA GRAVIS*

BY F. M. MILLER, JR., M. D., AND HAROLD H. DODDS, M. D.

The treatment of myasthenia gravis until recent years consisted merely in avoiding overexertion and other harmful influences. Nothing of any positive benefit was known. Edgeworth's[1] discovery in 1930 of the improvement caused by ephedrine afforded the first remedy of any great value. In occasional cases irradiation of the thymus has brought about a remission. The use of glycine, announced independently in 1932 by Boothby[2] and by Remen,[3] has aided many. More recently, potassium chloride and Benzedrine Sulphate have come into use, with conflicting reports concerning their efficacy.

In 1934, Mary B. Walker[4] of London reflected upon the similarity between myasthenia gravis and curare poisoning, in which the paralytic action is exerted at the myoneural junction. Knowing that physostigmine was a partial antidote for curare poisoning, Walker experimented with this drug in myasthenia and found that injection of gr. 1/50 produced in half an hour a striking improvement which lasted four or five hours. She attributed the success of physostigmine to its preservation of acetylcholine at the myoneural junction. At parasympathetic nerve endings it has been demonstrated that acetylcholine acts as an intermediary for the passage of the impulse from the nerve ending to the muscle, and it is likely that the same process exists at voluntary neuromuscular junctions. Any acetylcholine absorbed into the blood stream is destroyed by an esterase in the blood and in this way the action of acetylcholine is kept localized. The destruction of acetylcholine by this esterase is inhibited by physostigmine. In myasthenia gravis it is supposed that there is either an insufficient production of acetylcholine or an excessive destruction of it and that physostigmine maintains it in the proper amount. Additional evidence that the pathological process is located at the end-plate is afforded by chemical studies of the muscles, which reveal no abormality of the intrinsic chemical mechanism of muscular contraction,[5] and by electromyograms, which show that the nerves are delivering impulses normally to the junctions.[6]

*Presented before the Utica and Syracuse Academies of Medicine, September 22, 1938.

In February, 1935, Walker[7] reported the hypodermic use of prostigmin, a synthetic drug similar in its chemical composition and in its properties to physostigmine. Prostigmin was found preferable as it exerted less depressing effect on the heart, less often caused nausea and vomiting and seemed safer in large doses. Several authors soon confirmed Walker's work and it was recognized that prostigmin furnished not only the treatment but also the final diagnostic test, for no other neuromuscular disorder gave the same immediate, marked response, while all cases of myasthenia gravis did so respond. In some patients the improvement seen with the first injection wanes with continued use, and instances of respiratory failure have occurred even under adequate dosage. Fortunately most patients receive the same degree of benefit from each succeeding dose as from the first. For continued treatment outside the hospital, the parenteral use of prostigmin is often unsatisfactory because of the brief duration of its effect, the difficulty of arranging for frequent injections and the expense.

In December, 1935, Everts[8] reported the successful treatment of two cases with prostigmin given orally. Much larger doses were found necessary by this route. Whereas the maximum dose hypodermically was 2.5 mg., Everts considered 30 mg. three times a day to be the optimum oral dose. Under this regime his two patients were able to carry on their usual work.

Case Report

History: L. T. (N. Y. S. Ident. No. 311109), a housewife, aged 20 years, had been seriously ill with bronchopneumonia following childbirth in April, 1936. In June, 1936, she had a severe pelvic inflammation which was drained through the abdomen and through the vagina. She improved rapidly, regained her normal weight and for several months felt perfectly well although some drainage continued from the abdominal wound for two years.

One evening in January, 1937, her lids began to droop and she felt that her smile was forced. Two days later she noticed that she was unable to pucker up her lips to whistle. A few weeks later, during an acute respiratory infection, her ptosis became pronounced and diplopia developed. A few months after this she ex-

perienced difficulty in speaking. She became unable to raise her arms above her head. Her legs became weak so that she was unable to go up and down stairs and she frequently fell in walking. In July, 1937, chewing and swallowing became increasingly difficult. She choked on solids and liquids regurgitated through the nose. Because of this there was a progressive loss of weight. At times her jaw would hang open and she could close it only with the aid of her hand. Her illness was recognized as myasthenia gravis and for over a month she was treated vigorously with glycine, potassium chloride and Benzedrine Sulphate, but without benefit. She was admitted to the Marcy State Hospital, October 10, 1937.

Examination: Examination showed ptosis, facial weakness; in short, weakness of all the voluntary muscles innervated by the cranial nerves as well as of all the musculature of the trunk and limbs. The ptosis was variable and became more marked after repeated attempts to raise the lids. She had great difficulty in looking upward and after a few attempts her weakness increased so that she was unable to look above the horizontal plane. She was likewise unable to maintain prolonged lateral gaze. After such efforts there was an internal strabismus with diplopia. The jaws could not be kept closed against resistance and at times would hang open. Her face was smooth and expressionless. She was unable to close her eyelids tightly. In attempting to show the teeth bilateral weakness of the face was shown. She was unable to whistle and could not close her lips sufficiently to hold a cigarette. The palatal excursion was limited. Speech was indistinct and of nasal quality.

In the limbs weakness was most marked in the deltoids; the arms could not be abducted to a horizontal position. Her grip was too weak to register on the dynamometer and after squeezing the examiner's hand several times in succession she was barely able to close her fingers and could not fully extend them. After a period of rest her grip was restored but again would fail after squeezing a few times. In walking, her legs occasionally gave way and at night, when her symptoms were always more marked, she was unable to walk without assistance. At times she was unable to raise her head from the pillow, could not turn over in bed, could not sit erect without support and could not hold her head erect. The

Before injection of prostigmin. Patient is trying to look upward

One hour after injection of 0.5 mg. prostigmi

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muscles showed no atrophy or fibrillation. The deep and superficial reflexes were normally active and there was no disorder of sensation. X-ray of the chest showed no evidence of enlargement of the thymus. The blood Wassermann was negative. There was a moderate anemia and a slight leukocytosis.

Course: A few days after admission she was given an injection of 0.5 mg. of prostigmin intramuscularly. In five minutes an improvement in her ptosis was noticeable. Her face gradually lost its dull, drowsy expression and became alert. She was able to look upward, show her teeth, speak without any nasal tone, drink water without regurgitation, and elevate her arms above her head. For the first time in three months she was able to eat without choking or supporting her jaw with her hand. The improvement was maximal half an hour after injection, continued so for three hours, and then gradually waned. There was some lowering of blood pressure, but no change in pulse rate. For a time thereafter the patient was given injections three times a day, before meals. This dosage enabled her to eat with ease. She gained weight rapidly and was comfortable throughout most of the day. If she had to get up at night, however, she required assistance in walking and on returning to bed she was too weak to pull up the bed clothing.

On October 19, 1937, the oral administration of prostigmin was begun and it was found that one tablet of 15 mg. would produce effects of approximately the same degree and duration as 0.5 mg. hypodermically. When this was given only three times a day, however, the patient was helpless at night. Extra doses were added in the evening and in the middle of the night. This regimen prevented any danger of respiratory failure during the night and enabled the patient to look after her needs throughout the 24 hours.

Because of the coexistent pelvic infection in this case and the belief of some writers that myasthenia gravis is of bacterial origin, the patient was given sulfanilamide for three weeks without effect either upon her myasthenia or the drainage from her abdominal sinus.

For the past 10 months she has been at home, not only looking after her own needs but taking care of her two-year-old daughter and doing all of her own housework. She takes between 8 and 12 15-mg. tablets distributed throughout the 24 hours, the number de-

pending on the extent of her activity and the daily fluctuations in her condition. Her weakness is aggravated by extremes of heat or cold, menstruation, infection, excitement or unsual exertion. Apart from these factors there are spontaneous exacerbations during which more frequent doses are required and periods of improvement when her strength is normal on a reduced dosage. Ten minims of tincture of belladonna taken two or three times a day are usually sufficient to prevent the appearance of toxic symptoms. On one occasion when going out for the evening the patient was particularly anxious to show no trace of weakness and took three tablets within 45 minutes. About an hour later the undesired parasympathetic effects manifested themselves in the form of vomiting, colic, urgency of defecation and urination, blurred vision, sweating and faintness. These symptoms were promptly relieved by atropine. Similar toxic effects from a 45 mg. dose of prostigmin in normal people were reported by Goodman and Bruckner.[9] Drainage from her abdominal sinus ceased in June, 1938, and the wound has remained closed.

Comment

It is expected that the drug will have to be continued indefinitely unless our patient is fortunate enough to have a spontaneous remission. Her condition at present is much better than at the beginning of treatment and represents an improvement over her state of four months ago. Diplopia, which persisted to some extent during the early months of treatment, now rarely occurs. The experience of others has been that prostigmin does not cure the disease, but that most patients continue indefinitely to secure relief from the same dose or a smaller one. At any rate, this patient has changed from a life of invalidism to one of normalcy. She attends to her household duties, goes shopping, joins her friends in social gatherings and is prohibited only from engaging in strenuous physical activities.

The oral treatment is much less expensive and with this method the patient is able to take doses at frequent intervals, thereby avoiding the slumps which occur between widely-spaced injections. Using this scheme of dosage, Viets, Mitchell and Schwab[10] treated 23 cases with benefit in all; many of them were able to return to their former occupations.

Conclusion

A case of myasthenia gravis is reported in which prostigmin has been used orally for a period of 11 months, enabling the patient to pursue her usual occupation.

Because of a coexistent pelvic infection sulfanilamide was tried but without benefit.

293 Genesee Street
Utica, N. Y.

Marcy State Hospital
Marcy, N. Y.

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THE TECHNIQUE OF THE INSULIN SHOCK AND METRAZOL TREATMENTS

BY L. LARAMOUR BRYAN, M. D.

Insulin Shock Treatment

Selection of Cases:

New cases, or those of relatively short duration, are preferable for insulin hypoglycemic shock treatment. A patient with a well-preserved personality, fair educational advantages and whose mental disorder is of short duration, undoubtedly offers the best prognosis. However, if this treatment is ultimately to be of value in a broader sense one must treat cases of longer duration. Patients who have been ill for four or five years occasionally show a good response. Individuals with a basically subnormal intelligence seem to have an extremely poor prognosis and thus far the writer has not seen any of these show an appreciable improvement.

Patients should be in good physical health. A careful physical examination should be done. An X-ray or fluoroscopic examination of the chest is advisable and if cardiac lesions exist electrocardiographic readings should be obtained. Veins should be good or at least accessible, as it may be necessary to give intravenous glucose at any time as a life-saving measure.

Undernourished patients can usually be treated safely for as a rule their physical condition improves under treatment. The appetite being keener they usually gain in weight.

Orientation of Patients:

A psychological approach is advisable in preparing patients for insulin hypoglycemic shock treatment. It has proven to be of definite value. If patients are in good contact and accessible one should discuss the treatment with them briefly as in this way one may, to a certain degree, avoid psychic trauma. It is not advisable to place patients in a treatment room without enlightening them as to what the treatment is for or what is expected of them. We are frequently asked by relatives whether or not we think it advisable for them to inform the patient about the treatment. In almost every instance we advise the relatives to do so. In this way pa-

tients are more likely to have confidence in their relatives and it simplifies matters for the physician in establishing rapport. If one can have the patient enter the treatment room willingly and in a cooperative mood subsequent treatment will in all probability be more satisfactory.

Diet:

A small breakfast low in carbohydrates is given prior to treatment as we have found that when no breakfast is given many patients become disgruntled. A high carbohydrate diet is given for dinner and supper in order to keep a favorable carbohydrate balance and thus prevent a latent shock.

Medication:

Sakel prefers to give tincture of digitalis minims 15 t. i. d., or its equivalent for three days and then minims 15 daily for the remainder of treatment. We feel that this is of doubtful value and now we do not use it routinely. Magnesium sulphate is of value in patients who become constipated after the administration of insulin. It should not be used routinely, however, as under treatment some cases develop diarrhea.

Treatment Room and Personnel:

The treatment room should be made as attractive as possible so that it lends an air of cheerfulness to the patient. It is important that the personnel should have a kindly, sympathetic attitude toward the patient as this may give him confidence and a sense of security. Our treatment room will accommodate 30, 15 males and 15 females. It should be equipped with running water so that one can wash the hands and use reasonably good technique in tubefeeding and in giving intravenous glucose.

Preparatory Phase:

Sakel recommends 15 or 20 units of insulin as an initial dose. Subsequent doses can in most cases be increased by 20 units per dose. In this way the shock dose will be reached in the average case in from three to ten days. By increasing the dose rapidly one eliminates a certain amount of psychic trauma and the patient complains less about the unpleasantness of the treatment. Occasion-

ally a patient may go into too deep a coma on 40 units of insulin. Should this occur the hypoglycemic state should be interrupted by the administration of intravenous glucose, and subsequent doses should then be reduced. By increasing the dose of insulin rapidly the patient may become comatose on a smaller dose as he does not have the same opportunity to develop a tolerance as when the dose is increased slowly.

Before the shock dose is reached it is thought advisable to screen new patients so that they will not be unduly upset by tube feedings, convulsive seizures and other undesirable phenomena occurring in other patients. It is also thought desirable to keep patients who are starting treatment away from those who act as agitators. Two of our patients who were cooperative for the first few treatments became uncooperative because they came in contact with a disturbing and unappreciative patient, who had received this treatment.

In the treatment room the shades should be drawn, the eyes covered and all unnecessary noise should be eliminated.

Shock Phase:

During the shock phase one must be ever on the alert for danger signals. The pulse should be checked frequently, starting immediately after the injection of insulin. Occasionally a patient is seen whose pulse rate starts dropping immediately following the injection. One such patient developed a marked bradycardia almost immediately after the administration of insulin. The pulse rate sometimes drops to 35 beats per minute. Then as the hypoglycemic period continues the pulse may become irregular and intermittent. Rapid swings in the pulse rate, say from 40 to 120 to 130 and then back to 50 or 60, are regarded as forerunners of danger and may indicate cardiac failure.

During the period of excitement the patient may have to be protected from himself by the use of a restraint sheet, especially if he develops the so-called hunger excitement. It is thought advisable to explain the purpose of the restraining sheet to the patient if he is in good contact and able to understand. Many patients seem to appreciate the reason for their restraint.

Frequently before the onset of coma patients become more accessible. They may request an interview with a physician and valuable information may be obtained as they often discuss their difficulties and in this way unburden themselves. It is often necessary to reassure them at this time, whereupon they usually lapse into a quiet coma.

After the onset of coma one must watch for excessive salivation because aspiration of saliva is a constant threat to the well being of the patient. The head should be turned to one side and in some cases it may be necessary to turn the patient face down.

Large enough doses of insulin should be given so that the patient will start to become comatose by the end of the second hour. It is true that by so doing one is likely to encounter more convulsive phenomena, but the writer feels that an improved mental condition often follows convulsive seizures. We never try to prevent these seizures whether they occur early or late, and we do not interrupt hypoglycemia rapidly. A few minutes after the seizure the nasal tube is introduced and sugar solution given. Occasionally patients awaken after the seizure and are able to drink the solution.

The length of coma must be determined by the patient's condition. If no danger signs such as cardiac and respiratory embarrassment are present coma may be allowed to continue for from one to two hours. The hypoglycemic period usually lasts approximately four hours. Of course it might last longer than this, but if large doses of insulin are given complications usually develop which necessitate interruption.

Paranoid types of dementia præcox seem to require deep coma. Of course, there are exceptions to all rules and occasionally a paranoid case may become depressed following deep coma. In one such case the dose of insulin was reduced, the patient did not go into coma and she began to improve. As a rule patients with depressive tendencies seem to react better if the comatose dose is not reached. Stuporous cases should be terminated when they become more active.

Method of Termination:

Ordinarily it is preferable to terminate hypoglycemia by the nasal tube. A solution of unrefined brown sugar is used and seems

to be absorbed more rapidly than cane sugar. We use a solution of brown sugar 16 grams to the ounce. A more concentrated solution could be used, but Hunt and Feldman[1] feel that it does not seem to absorb as quickly. Probably a more dilute solution than 16 grams to the ounce might be indicated in some cases. Sugar solution should be warm as it seems to become absorbed more rapidly. We prefer to keep the solution in gallon jugs as we can seen no advantage in having a separate container for each patient. By using a graduated pitcher it is a simple matter to pour out the required amount. If patients are partially conscious they may of course be able to take their sugar solution orally.

If patients do not react to glucose given by the nasal tube after 20 minutes or half an hour, intravenous glucose may have to be given. We have found the 50 per cent solution satisfactory although Sakel recommends 33 per cent. This more dilute solution might seem preferable, being less irritating to the veins. We have found that in many cases 20 c.c. of the 50 per cent solution is sufficient for intravenous administration. This small amount appears to act somewhat like a catalyst stimulating the absorption of the sugar solution which had been given previously by the nasal tube. In emergencies intravenous glucose is always given immediately in adequate amounts.

After intravenous glucose is given the arm should not be flexed at the elbow because this compresses the vessel wall and assists in sclerosing the veins.

In instances of pulmonary edema, atropine grs. 1/100 seems to be of definite value and, of course, intravenous glucose is given in order to terminate hypoglycemia as rapidly as possible.

In cases showing evidence of cardiac collapse adrenalin 1 c.c. followed by metrazol 1 c.c. p. r. n. seems to be of definite value.

Sometimes patients show evidence of cerebral irritation after adequate amounts of intravenous glucose have been given as well as sugar solution by the nasal tube. They continue to have severe myoclonic twitchings. In one such case intravenous sodium amytal grs. 7½ stopped the twitchings almost immediately.

After the interruption of the hypoglycemic state patients are given a high carbohydrate meal. Following this they are returned to their various wards where their activities should be supervised

for the remainder of the day. It is during this period that occupational therapy is of value. Some patients may prefer to play cards, pool, or other games. Some feel they are stimulated and refreshed by some form of hydrotherapy at this time. Still other patients complain of extreme fatigue following the interruption of hypoglycemia and may require rest rather than too much activity. A few may need rest because of complications.

Psychotherapy is of value during the hypoglycemic state and following its interruption. The patient may develop a period of lucidity during hypoglycemia and may ask to interview the physician to discuss some problems. Still others become fearful and require reassurance.

It seems advisable to hold interviews following termination of hypoglycemia, since patients are usually more accessible at this time. Many of them derive considerable benefit from discussing their difficulties. It makes for a better understanding between physician and patient and assists the latter in regaining confidence and in making a more satisfactory adjustment.

Duration of Treatment:

Sakel suggests that the average number of treatments be approximately 40 but some patients require many more. If the patient responds satisfactorily he should remain free from mental symptoms both in and out of hypoglycemia. The writer, heretofore, preferred to treat patients until they were free from symptoms. Still, this is not possible in some cases as the patient's psychosis may not be altered to any appreciable degree by continued treatment.

Laboratory Work:

It is desirable to carry on as much laboratory work as possible so that we may learn more about the physiological reaction. Urinalyses should be done at least two or three times a week. At Marcy State Hospital they are done daily, but this is not absolutely necessary. The urine should be tested for urobilogen as its presence may indicate liver damage. If urobilogen appears frequently patients should be given more rest days. Study of the blood picture is advisable. Blood sugar should also be done, especially in those patients who remain confused or semistuporous after adequate amounts of intravenous glucose have been given.

Discharge from Hospital:

In those patients who appear much improved or recovered a short period of observation in hospital is indicated. This tends to eliminate those who are not well enough to live outside the hospital and the number of patients who have to return to the hospital is reduced. Suitable occupational therapy following treatment is of value. So far as possible they should be given work from which they will derive some satisfaction. This aids them in getting re-established and gives them more confidence to carry on outside the hospital. The home situation should be studied and, of course, an attempt should be made to learn what precipitated the patient's illness, and the patient should be advised how to conduct himself in order to remain well. In many cases a new environment seems preferable, but this is not always possible.

Metrazol Therapy

Selection of Cases:

The technique of metrazol therapy is similar to that of the insulin shock treatment in many respects. For instance, the selection of patients and their preparation for treatment will be essentially the same. The psychological approach is equally as important in this group and the physical contraindications will run parallel. Due to the severity of the convulsive phenomena seen with metrazol therapy the danger of causing cerebral accidents is greater hence it is not advisable to treat patients over 50 years of age.

Preparation of Patients for Treatment:

As in insulin therapy all patients should have a complete physical examination accompanied by an X-ray or fluoroscopic examination of the chest. Friedman[2] believes that a patient will exhibit convulsive phenomena much more readily if the system is alkaline, therefore, the patient is given an alkaline diet along with sodium bicarbonate grains 20 t. i. d. as long as treatment continues. The patient is encouraged to take fluids freely. At least 2,000 c.c. a day should be taken. It might be mentioned here that it seems preferable to give sufficient alkali to have the urine alkaline in reaction. This, however, is difficult to accomplish in certain cases, and it seems to make very little difference so far as the convulsive phe-

nomena are concerned. The author has observed that some patients show convulsive phenomena whether or not the urine is alkaline.

Procedure:

Friedman prefers to give camphor before metrazol. When this is done, a 25 per cent solution of camphor in olive oil is ordinarily used. It is administered by the intramuscular method and is given twice daily usually at 9:00 a. m. and 5:00 p. m. The initial dose is 16 c.c. This dose is increased by 4 c.c. a day until the maximum dose of 56 c.c. is reached. If the patient has a convulsive seizure before the maximum dose is reached, we proceed with metrazol. If the maximum dose is reached and no seizures have occurred, no more camphor is given, but treatment is continued with metrazol. The writer feels that camphor may be of very definite value in some cases. Friedman believes that some patients will respond to camphor alone and may not respond to metrazol. Then too, camphor has a tendency to keep the patient in a clouded state and the subsequent use of metrazol appears to be more efficacious.

Administration of Metrazol:

Metrazol is a 10 per cent aqueous solution and it is given intravenously three times weekly. Friedman prefers to start with an initial dose of 5 c.c. of metrazol. However, we have frequently seen convulsive phenomena on 3 c.c. and, therefore, we prefer to start with that dose. It must be given rapidly as the same dose given slowly may not produce a convulsive seizure. The maximum dose of metrazol has been set at 16 c.c. If the patient fails to have a seizure on 3 c.c., the dose is increased 1 c.c. at each subsequent treatment. The dose is never increased until the patient fails to have a seizure on the previous dose given. When a patient has a petit mal attack the dose is increased only ½ c.c., although it could be increased a whole cubic centimeter with safety.

The seizures caused by metrazol resemble those of epilepsy. An aura frequently occurs and in many instances this is terrifying. Sakel believes this terrifying aura to be a most undesirable feature, while others believe that it is an aid in breaking down the patient's psychosis. Following the aura there may or may not be an outcry. When it does occur it is often sharp and piercing. Fol-

lowing this one may observe the tonic spasm, clonic spasm and clouded state. The tonic spasm is especially valuable in these cases because it is during this brief period that one is able to insert a gauze roll between the teeth and thus prevent tongue-biting. Patients should be observed closely during the convulsive period and it should be noted whether or not the neurological involvement is equal on both sides of the body, and if found to be unequal a further neurological checkup is indicated, as there is always the possibility of some neurologic disease in such cases. Patients should remain in bed about an hour following the seizure and longer if there are complications, such as respiratory embarrassment or cardiac involvement. Occasionally the pulse may remain rapid for an hour or two.

Complications:

Where convulsive phenomena occur the possibility of status epilipeticus must be borne in mind. Therefore, one must be ready to deal with such emergencies as they arise. It is advisable to have chloroform, ether and intravenous sodium amytal in readiness. Intravenous sodium amytal is probably the most efficacious, but it should be used with extreme caution. Dislocation of the jaw is a fairly common complication—we have had five such experiences. Dislocated shoulders may occur. Occasionally patients complain of pain in the back following the seizures. In these an X-ray examination should be made as one must keep in mind the possibility of fracture of the transverse processes of the vertebrae.

Amount of Treatment:

Many patients require from 15 to 20 grand mal seizures before a remission occurs. In some instances remissions never do occur. If no remissions occur after 15 or 20 seizures a rest period should be given and treatment resumed after two or three weeks. At this hospital we have seen remissions after three or four convulsive seizures. However, it is thought advisable to produce about three convulsive seizures after a remission has apparently occurred, in order to cause a fixation of the mental condition at the improved level.

General Management of Patients:

We feel that the best results are obtained when occupational therapy and psychotherapy are used in conjunction with this treatment. The seizures apparently make the patient more accessible, thus enabling one to make use of psychotherapy and occupational therapy to better advantage. Therefore, the patient may derive considerable benefit from an interview soon after he regains consciousness following the convulsive seizure. One should also take advantage of this lucid interval to stimulate the patient's interest in the environment. We have found that patients could be interested during this period whereas otherwise it seemed impossible.

Marcy State Hospital
Marcy, N. Y.

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RESULTS OF METRAZOL THERAPY IN SCHIZOPHRENIA*

BY NATHAN BECKENSTEIN, M. D.

In 1935 Meduna[1] published his paper entitled "The Convulsive Therapy of Schizophrenia," in which he called attention to the observation of others that a biological antagonism seems to exist between epilepsy and schizophrenia. On this basis he introduced the convulsive therapy, first with camphor and then with cardiazol, known also as metrazol. Of his series of 110 patients treated, 54 showed remissions and 56 showed no change. Among the latter were many chronic patients; among his early cases the remission rate was 82 per cent. Subsequently, other investigators, notably Emerick Friedman[2] at the Buffalo City Hospital, demonstrated results similar to Meduna's—75 to 80 per cent remissions in the early cases.

With this in mind and with the purpose of testing the feasibility of this type of treatment in an active mental hospital, the metrazol treatment of schizophrenia was begun with male patients at the Brooklyn State Hospital on October 30, 1937, and with female patients on November 16, 1937. The technique followed was essentially that of Meduna[1] starting, after alkalinization, with the intravenous injection of a small dose of 10 per cent aqueous solution of metrazol and gradually increasing this to the convulsion-producing dose. The latter averaged 10 c.c. for the males and 6 c.c. for the females. Treatments were given three times weekly. A course of treatment consisted of 20 convulsive seizures, but sometimes as many as 40 were given. The patients were kept in bed in a recovery room adjoining the treatment room until they had recovered from the effects of the convulsion. This occurred usually within an hour. After each treatment patients were examined for injuries, particularly fractures, dislocations, torn muscles, et cetera, which might have been sustained during the convulsion and might necessitate immediate care and the discontinuance of further metrazol therapy.

Because of time limitation, only general results will be mentioned. To date (March 26, 1938) 232 patients were placed on treatment, but 14 had to be excluded from the series, because the occurrence of complications (lung abscess, pneumonia, fractures,

*Read at the Interhospital Conference of the New York down-State hospitals on April 8, 1938.

et cetera) prevented completion of the course of treatment. This report of results, therefore, will concern itself with the 218 completed cases.

Table 1 illustrates the distribution of 218 patients according to sex, diagnosis and status (on parole or in hospital).

TABLE 1. NUMBER OF PATIENTS TREATED

Diagnosis	Male			Female			Total		
	On parole	In hospital	Total	On parole	In hospital	Total	On parole	In hospital	Total
Mixed	0	0	0	0	1	1	0	1	1
Catatonic	17	33	50	12	61	73	29	94	123
Paranoid	11	18	29	5	18	23	16	36	52
Hebephrenic	3	22	25	3	14	17	6	36	42
Total	31	73	104	20	94	114	51	167	218

There were 104 males and 114 females; 123 of the 218 patients were classified as catatonic, 52 as paranoid, 42 as hebephrenic, and 1 as mixed. Fifty-one patients were on parole and 167 remained in the hospital.

In order to determine the relationship between the duration of the psychosis and the result of therapy, the patients were divided into three groups, namely, those with duration of psychosis up to six months, those from seven months to two years, and those over two years. In Table 2 the distribution of patients is shown according to duration of psychosis and status.

TABLE 2. DURATION COMPARED WITH STATUS

Duration	Male			Female			Total		
	On parole	In hospital	Total	On parole	In hospital	Total	On parole	In hospital	Total
Up to 6 mos.	9	0	9	7	7	14	16	7	23
7 mos. 2 yrs.	15	20	35	6	31	37	21	51	72
Over 2 yrs.	7	53	60	7	56	63	14	109	123
Total	31	73	104	20	94	114	51	167	218

Of the patients on parole, 24, or 77.4 per cent, of males and 13, or 65 per cent, of females had a duration of less than two years; together, they comprised 72.5 per cent of all paroles.

Fifty-three, or 72.6 per cent, of males remaining in the hospital and 56, or 58.5 per cent, of females remaining had a duration of more than two years; together, they comprised 65.2 per cent of all patients still in the hospital.

It will be noted that the majority of those patients who were paroled had a duration of less than two years, whereas the majority of all who remained in the hospital were ill longer than two years. In several instances, the duration was as long as 15 to 20 years.

Pursuing further the question of the relationship between duration of illness and result of therapy, the following table presents the average duration of illness according to diagnosis, sex and status:

TABLE 3. AVERAGE DURATION IN MONTHS (GROUPED BY DIAGNOSIS)

Diagnosis	On parole		In hospital	
	Male	Female	Male	Female
Catatonic	31	17	63	37
Paranoid	21	22	30	48
Hebephrenic	42	21	80	32

One can see from Table 3 that, regardless of diagnostic grouping, patients of both sexes who have remained in the hospital have an appreciably longer duration of psychosis than those who have gone home.

It was of interest to determine the condition of the paroled patients and how much, if any, improvement took place in those who remained in the hospital. Tables 4 and 5 demonstrate the results on this point.

TABLE 4. CONDITION OF PATIENTS ON PAROLE

	Male				Female				Total			
	Recovered	Much improved	Improved	Unimproved	Recovered	Much improved	Improved	Unimproved	Recovered	Much improved	Improved	Unimproved
Catatonic	1	9	6	1	0	3	9	0	1	12	15	1
Paranoid	4	5	2	0	0	5	0	0	4	10	2	0
Hebephrenic	0	0	3	0	0	0	3	0	0	0	6	0
Total	5	14	11	1	0	8	12	0	5	22	23	1

Table 4 shows that of the 51 individuals who have gone home, 5 (9.8 per cent) were considered recovered; 22 (43.1 per cent) much improved; 23 (45.1 per cent) improved. It will also be noted that the best results occurred among the paranoid types. Of 16 patients with this diagnosis, 14 were considered either much improved or recovered. Compare this with 13 out of 29 catatonics and none of six hebephrenics with the same grouping of condition.

TABLE 5. CONDITION OF PATIENTS IN HOSPITAL

	Male			Female			Total		
Diagnosis	Much improved	Improved	Unimproved	Much improved	Improved	Unimproved	Much improved	Improved	Unimproved
Mixed	0	0	0	0	1	0	0	1	0
Catatonic	0	12	21	0	19	42	0	31	63
Paranoid	3	8	7	0	7	12	3	15	19
Hebephrenic	0	4	18	0	4	9	0	8	27
Total	3	24	46	0	31	63	3	55	109

In Table 5, it is found that the decided majority, 109 of 167 patients (65.2 per cent) remained unimproved, but 3 (1.7 per cent) were considered much improved; 55 (32.9 per cent) improved. Note here again that the paranoid patients showed a greater proportion of improved conditions than the others. Eighteen of the 37 were regarded as improved or much improved; whereas, 31 of the 94 in the catatonic type and 8 of the 35 in the hebephrenic group received the same classification of condition.

In all fairness to this method of treatment, it is important to evaluate the results according to the duration of the illness. Table 6 presents interesting facts.

TABLE 6. CONDITION COMPARED WITH DURATION—ALL CASES (218)

	Recovered	Much improved	Improved	Unimproved	Total cases	Per cent showing improvement	Per cent paroled	Number of cases paroled
Up to 6 mos.	3	8	10	2	23	91.3	69.5	16
7 mos. to 2 yrs.	1	11	31	29	72	59.7	29.1	21
Over 2 yrs.	1	6	36	80	123	34.9	11.3	14
Total	5	25	77	111	218	49.1	23.3	51

Of the 23 patients with a duration up to six months, there was definite improvement noted in 21 (91.3 per cent). Sixteen (69.5 per cent) were paroled. In the 7 months to 2 years group 43 of the 72 (59.7 per cent) showed definite improvement. Twenty-one, or 29.1 per cent, were paroled. In the group with a duration longer than two years, 43 of the 123 patients (34.9 per cent) were considered definitely improved. Fourteen (11.3 per cent) were paroled. It seems, therefore, that the greatest proportion of favorable results occurred in those patients in whom the psychosis had been of shorter duration.

It was interesting to learn what effect metrazol therapy had on those patients who had previously been treated with insulin without success.

TABLE 7. RESULTS WITH METRAZOL FOLLOWING INSULIN THERAPY

	Recovered	Much improved	Improved	Unimproved	Paroled	Total cases
Female	0	0	8	17	2	27
Male	0	0	6	9	2	17
Total	0	0	14	26	4	44

Table 7 demonstrates that of 44 patients previously treated with insulin, 18 were improved, four of these having been paroled. It might be said, at this point, that those who remained in the hospital and were considered improved were better in their behavior. For instance, if formerly, they had been tubefed, untidy or destructive, they now ate by themselves, were clean and cooperative. In short, while not suitable to go home, they were much easier to manage in the hospital.

On examining the duration of illness in the patients previously treated with insulin it was found that the distribution was similar to that of the general run of the series, that is, the majority of those who were considered improved had a duration of psychosis less than two years and those who were unimproved had a duration of illness of over two years. It is apparent, therefore, that even with a previous course of insulin therapy the more chronic patients do not respond. Furthermore, it seems that where insulin therapy has not met with success, metrazol has been unsuccessful.

At the time of this writing, treatment has not been completed in patients who have had the reverse order, namely, metrazol therapy without success and then insulin treatment.

Weight

The average gain in weight was 2.5 pounds for the male patients and 5.2 pounds for the females, an average gain for both of 3.8 pounds.

Complications

Up to March 26, 1938, there were 6,951 treatments administered with 5,395 grand mal and 595 petit mal seizures. The following are complications which have been encountered and which, as stated previously, necessitated discontinuing treatment in 14 cases.

Dislocation of the jaw occurred 67 times, frequently in the same patients. Usually the dislocation was spontaneously reduced as the patient emerged from the convulsion. In no instance was it necessary to discontinue therapy because of this. Six cases of lung abscess developed in the course of treatment; one ended in death. Four patients subsequently developed pneumonia; one woman died of bronchopneumonia, one man of lobar pneumonia. Two males sustained intracapsular fractures of the neck of the femur. One died two weeks after operation, of pneumonia. One woman suffered a dislocated shoulder and one man developed a state similar to status epilepticus which had to be controlled by sodium amytal given intravenously. The latter had no unusual sequelae. In all these 14 patients with complications, treatment had to be discontinued.

While none of the deaths mentioned above were directly attributable to metrazol itself, a brief review of each case might be helpful to those working with convulsive therapy. Note that in all four patients metrazol treatment was not completed.

Case 1: Male, age 29. Had 15 grand mal convulsions, one petit mal with dosage of 8.6 c.c.. During his treatment on December 17, 1937, he sustained an intracapsular fracture of the neck of the femur. This required open reduction which was done on December 22, five days later. He had a stormy course, developed pneumonia and died January 3, 1938, two weeks after operation.

Case 2: Male, age 41. Began metrazol treatment on January 8 and had four grand mal seizures and one petit mal with a dose of 9 c.c., until January 18. On January 20 he had a fever of 103° with signs of pneumonia in both bases. He died February 6 of bronchopneumonia, three weeks after metrazol treatment was stopped.

Case 3: Female, age 44. Metrazol treatment was begun December 17 and up to January 19 she had nine grand mal seizures, four petit mal. January 24 foetor oris was noted. In February she began to show full signs of lung abscess which was confirmed by X-ray. She died February 21 of abscess of the lower lobe of the right lung. This was more than a month after treatment was discontinued.

Case 4: Female, age 30. Up to January 14 had five injections of metrazol with a dosage of 4.5 c.c., producing two grand mal seizures. On January 17 she complained of a cough. Physical examination showed signs of consolidation in left lung. She died January 19, 1938, of lobar pneumonia, five days after metrazol treatment was terminated.

Discussion

While the ultimate results of the metrazol therapy of schizophrenia at the Brooklyn State Hospital must await the test of time for evaluation of its efficacy, there are several definite facts and problems which stand out. First, that with this treatment patients whose illness is of shorter duration have a better outlook for the future, and conversely, those with a long duration have less chance of recovery. Second, that there are cases of long duration who do get well under treatment and hence introduce the problem of whether the depth of regression has any influence upon the ultimate outcome regardless of the duration. In this connection, it is noteworthy that the paranoid patients, generally regarded as having reached a higher level of psychosexual development and having regressed less than other types of schizophrenia, fare better under treatment than the others. Third, that in the course of treatment many individuals show temporary improvement, but upon cessation of treatment return to their former psychotic state. This suggests that some method must be devised in the future to sustain the improvement in cases of this type.

Summary

1. Two hundred and eighteen cases of schizophrenia have been treated with a complete course of metrazol therapy at the Brooklyn State Hospital. Fifty-one have been paroled and 167 remain in the hospital, showing either some form of improvement (58) or none at all (109).

2. Seventy-two and five-tenths per cent of all paroled patients had a duration of psychosis less than two years; sixty-five per cent of those who remained in the hospital had a duration of more than two years.

3. Among the patients with duration of psychosis less than six months, 91.3 per cent showed definite improvement; of these 69.5 per cent were paroled. Of the group between 7 months and 2 years duration, 59.7 per cent showed improvement, of whom 29.1 per cent were paroled. Of those with over 2 years duration only 34.9 per cent improved and 11.3 per cent were paroled.

4. In general, cases previously treated with insulin without success did not show any remarkable further improvement with metrazol, only 4 of the 44 such patients being paroled.

5. The average gain of weight per patient was 3.8 pounds.

6. Fractures and pulmonary conditions—lung abscess or pneumonia—are the chief complications of metrazol therapy.

Conclusion

Metrazol treatment seems to be of value in schizophrenia, but its final results must meet the test of time.

Brooklyn State Hospital,
681 Clarkson Avenue,
Brooklyn, N. Y.

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INSULIN AND METRAZOL THERAPY IN IDENTICAL TWINS

BY JAMES M. MURPHY, M. D., AND HENRY LUIDENS, M. D.

Observations based upon the study of one pair of identical twins can be of value only inasmuch as they add to the general store of information pertaining to twins. The present paper is offered as such a contribution.

We use the term *identical twins* as synonymous with the terms uniovular, monozygotic, similar, duplicate, homologous and monochorionic. Identical twins are the result of the fertilization of one egg; they have a common germinal basis for their somatic and psychic similarities.

We use the term *fraternal twins* to refer to twins who are the result of the fertilization of two eggs. Fraternal twins have no common basis in the germ for similarities. For this reason it is important to determine the matter of identical twins.

To establish definitely the fact of identical twinning we must have a reliable birth record describing the fetal membranes. Without this we assume twins are identical when they are of the same sex and bear closen resemblances in form and coloring.

In the case of our twins, the physician who attended the birth trusts his memory to report that there was one placenta and one amnion. They are of the same sex, bear the same coloring and are similar in general appearance. We presume that they are identical twins.

Since the production of twins is considered by embryologists to be an abnormal process, it is essential that we temper our impressions, deductions and conclusions with the knowledge that we are likely dealing with abnormal individuals.

Identical twins are rarely reported in animals other than humans. The litters of most mammals are like fraternal twins in that their numbers represent the number of eggs fertilized. It seems that fraternal twinning more closely resembles an earlier type of procreation in mammals than does identical twinning. Therefore, psychosis in its relationship to an inferior constitution is to be expected more frequently in identical twins.[1] This seems to be true of Siemens' cases of psychosis in twins.[2]

That the production of twins is an abnormal process is believed by Newman[3] who thinks it is the result of retarded development. Gordon[4] associates it with factors of degeneracy and finds it frequently in syphilis and other degenerative conditions. Wilder feels[5] identical twins are a form of double monster in whom separation occurred early in fetal life.

Rosanoff[6] believes that psychosis occurs in twins upon the basis of a Mendelian recessive. There are so many strikingly similar events in the lives of identical twins involving the soma that it is thought there are also parallelisms in their psychic lives. This seems[7] to be supported by the findings that psychosis in identical twins is seldom reported singly. The time of onset is often simultaneous. Even though the twins have been separated soon after birth, the onset and course of the disease is often remarkably alike. After years of residence in separate mental hospitals identical twins may show behavior, feeling and thought content which are very similar.

Report of a Case

Family history:

There is no history of nervous or mental disorder among the antecedents or collaterals on both sides. The father died at the age of 42, in 1923, of pulmonary tuberculosis. The mother, aged 56, is living and well. She is an enterprising individual, aggressive, self-assured, and determined. She works a small farm. Without assistance from relief agencies, she was able to send her boys through high school during depression years.

Personal history:

The patients, John and William, were born January 3, 1916. They are now 22 years of age. Birth was normal. John weighed six pounds, William weighed five pounds, at birth. John walked at 13 months, William walked at 15 months. Their father died in 1923, when the twins were seven years old, the mother remarrying in 1924. The stepfather was a ne'er-do-well alcoholic, who stole the mother's money to buy liquor. He beat her in the presence of the children, attacked the children in their sleep, and was several times disciplined in court.

At the age of eight John showed great fear of his stepfather and developed night terrors, which were frequent up to the age of 11. William did not become as emotionally upset in reaction to the stepfather's treatment. At the age of 11, in 1927, John, on several occasions rushed home thoroughly frightened, complaining that strange people and animals obstructed his path. At this age, William appeared to be more stable emotionally. He became interested in drawing and painting. At the age of 12, in 1928, the two began to show divergence of interests. John became interested in outdoor activities, and showed proficiency in athletics. William's activities consisted mainly in helping his mother with the housework, and using his spare time for drawing. In 1931, at the age of 15, they completed grammar school, receiving recognition for high scholarship. Beginning high school, they obtained good grades, took part in social and athletic activities. Reports from fellow students show they were well thought of, displayed no noticeable peculiarities, and were not considered queer or eccentric.

At the age of 19, they completed high school. John engaged in manual labor. He was efficient, liked his boss and coworkers. In December, 1935, he was laid off for lack of work. On finishing high school, William opened a sign shop. After two months, he showed the first signs of an approaching psychosis, and this is probably the date of onset. He complained of feeling weak and nervous. He thought his heart had stopped, feared losing his mind, and prepared his will. He was able to conduct himself so that his troubles were not obvious to outsiders. By January 1, 1936, his mother considered he had entirely recovered from this attack.

Both boys were in fairly good health until June, 1936. At this time William showed a recurrence of symptoms. His mother describes him as having become dreamy, forgetful, suspicious, complaining that mysterious forces were controlling his life. By November, 1936, he recovered from this attack sufficiently to reopen his sign shop, at which he did fairly well until May, 1937. In June, 1936, John, who had been working at hard manual labor, complained that he was no longer strong enough to do this work. He immediately obtained a job clerking in a clothing store. While working there, in December, 1936, his first mental symptoms were

noted, and they were in the form of paranoid delusions, in which he claimed his employers were "framing" him, were using "psychotelepathy" on him, were controlling his thoughts. He became very suspicious, felt that automobiles going by the house were part of a plan to destroy him. Yet his condition improved gradually, so that by April, 1937, his mother considered him entirely well. During the three months of the first attack, he showed a pressure of activity directed toward invention of machinery. At this time he was again able to work, and was employed by the W. P. A. until the onset of the present attack in December, 1937.

The onset of John's present attack was characterized by feelings that his actions were being controlled, and by auditory hallucinations in which "people were calling him names." The event precipitating his commitment was his assault with an axe upon his fellow workers. The onset of William's present attack occurred in May, 1937, when he complained of being excessively sleepy, became suspicious that there was an organized movement to have him put out of town. However, he continued to work in his sign shop. In December, 1937, he hired a young girl to assist him in making Christmas cards. He fell in love with her, visited her home, where he saw a spiritualist book on the table. This aroused his suspicions. He thought the girl's father was reading his mind, and charged the girl with attempting to seduce him. Later he felt he could heal all the people in the local hospital, and assumed other Christ-like activities. He painted pictures in red and foretold the end of the world from these. The event precipitating his commitment was his threat to run away from home to evade his persecutors.

A comparison of the twins before the onset of their psychosis is about as follows: John is larger, his bones are heavier, features are coarse, hair is straighter, voice is deeper, and generally his physique is more masculine than William's. He excels William in sports, outdoor activities, and ability to do heavy labor. William is gentler, has more grace in movements, is more free in social expression and warmer in his friendships; has more ability to create a good impression of his personality among his fellow men. He is more attractive to the opposite sex because he is somewhat quicker witted and more able to express himself in "small talk," less con-

strained in his efforts to make himself acceptable. He is more spontaneous, less self-conscious, and obviously enjoys the company of others to a greater extent than John. Of the two William excels in intellectual activities and consistently gained slightly higher marks in school, although the difference was not great.

In their pursuits, John tended toward heavy labor and practical methods of gaining a livelihood. William intended to make commercial art his field of work. He was tendered a job by a large concern after he reached the hospital. When stirred by the approach of their psychotic conditions, John took to inventing machinery, while William increased his activities at the drawing board. William talks of art and creation, while John plans to get a job in a factory. The mother thinks that William is the dominant member. John more often follows William in thought and action.

Course in hospital:

On admission John was mute, sat motionless in his chair staring at the floor. When aroused he would barely lift his face to look at the interviewer, seeming to exert himself to lift the cloud that was over him, but would slip back into his catatonic state without speaking.

William on admission was overactive, paced about in an elated manner, introduced himself to everyone, was facetious and at times was inappropriately hilarious. His speech was overproductive, rambling, disconnected, incoherent. He paid no attention to the questions asked him, but recited poorly related phrases such as, "there are a million volts running through me, you are trying to conquer God, the doctors control my actions, the world is coming to an end." He continued endlessly with a rapid flow of typically schizophrenic content.

During the month preceding the beginning of treatment, John showed very little change. On one occasion only, in a burst of volubility, he expressed a few words, "I am full of electricity, I am afraid something is going to happen. What are you going to do to me? It is all a great puzzle." This was the extent of his verbalizing.

William, during the same month, continued to express numerous bizarre ideas, but his motor activity became greatly slowed up, and

he talked much less freely. He now admitted, only after encouragement and persuasion, that Judgment Day was at hand, that he predicted the end of the world, that his body was full of electricity, that his thoughts were controlled by mind readers. He was well oriented, his memory was not impaired, and there was no noticeable degree of intellectual deterioration. Insight was totally lacking.

Insulin and metrazol therapy:

On January 31 John was placed on insulin treatment and William began his series of injections with metrazol. At the time treatments were begun, John was mute, motionless, assumed a catatonic attitude, had to be spoonfed, soiled himself with urine. William moved about slowly, expressed a few disconnected ideas and phrases, used many stereotyped, repetitious fragments of introductory conversation, which indicated that he was markedly blocked. For example he says, "I have something to say; let's see the point is this; I've been trying to figure things out; well, to begin with; I am an artist; John and I went to high school." He had periods of impulsive assaultiveness, had to be tubefed, frequently soiled himself with urine.

By February 9 William had shown some improvement, in that he was more able to express himself verbally, showed less blocking and actually completed a few ideas in a fairly orderly manner. Tubefeeding had been discontinued, he had been spoonfed for two days, but on this day was able to feed himself satisfactorily. He was also able to dress himself, which was a considerable improvement. John showed no change at this time.

On February 15 John had received four doses of insulin in quantities sufficient to produce coma, and on that day after recovering from coma he would talk rapidly for a few minutes and comment in a silly manner on the things which he saw about him, such as, "You are a doctor; I got iron lungs; I'm full of brown sugar." Upon return to the ward he immediately resumed his catatonic attitude and muteness. He still soiled himself and had to be spoondfed.

On February 22 John had another period of talkativeness following his return to consciousness, which period lasted a half hour, noticeably longer than the previous period. On return to the ward

he again lapsed into muteness. At this time William showed no further improvement.

On March 1 John rather suddenly became tidy, no longer soiling himself, and was able to eat satisfactorily without assistance. On this day William showed some interest in drawing and made a few simple sketches, which were his first attempts. His speech was in somewhat better order, and he was able to express a few complete ideas.

On March 10 John, whose periods of talkativeness occurred daily, following recovery of consciousness, and ceased when he returned to the ward, on this day continued his talking for an hour after he returned. His thoughts were more logical, although still very simple, but were altogether of better quality than his previous talk, which had consisted merely of facetious remarks about objects in the room. William showed no change from his previous condition.

On March 22 John's period of talkativeness lasted throughout the day, and he showed no tendency to relapse into muteness. He was very anxious to explain his experiences of the past three months, and seemed to have gained some insight. He said that "something tremendous occurred to him this morning." He related: "Amos went to heaven. I am taking Amos' place. You remember Amos, the sleepy fellow who sat in the chair looking at the floor with no life, I am taking his place." He described Amos as a tall, thin, blonde young man, who had been sitting rigidly in a chair for months staring at the floor. His description fitted himself. It was probable that he was describing himself. He showed greatly increased spirit. He styled himself as "the new individual who had replaced the old." He said, "I hope I don't have any more of those frightful experiences. Amos was scaring me. Maybe it was my imagination. He cut off arms and legs and jammed them down my throat. It must have been air I was swallowing. He tried to make a sucker out of me. He put bananas in his cheek and didn't swallow them. He also was a sword swallower. He put a horse-bit in his mouth and pulled the corners out. He was jawing at me, always stickings things in my mouth. He put his jaw out of joint, and pushed in tables full of food at one time. He snapped his

teeth at me. The minute I ate, he said, 'Spit it out.' He said, 'Puke up everything.' I am glad Amos is gone. Now I'll feel better." John's conversation was limited to explaining the oral proclivities of Amos. His speech was well ordered. He expressed his thoughts in logical order, showed no blocking. Emotional expressions which accompanied his description were quite adequate and appropriate. He laughed at some of the absurdities, and generally his affect was much improved. Sensorium was clear. Memory was good. He showed no intellectual deterioration. He recounted historical events and matters of science, art and literature fully as well as the average high school graduate can. For the first time he showed some appreciation for his brother's deplorable mental state. He paid him considerable attention, encouraged him, tried to help him express himself in a more intelligible manner. He said to William, "You're not as well as I am. Look, my face is fatter. You are still all fogged up. You should have the insulin treatment."

William showed marked blocking, illogical progression of thought, incoherent and irrelevant response. His only complete sentences were those which he had repeated to himself frequently and were now stereotyped and repetitious, such as the following, "I tell you doctor we are high school graduates, we took up physics, chemistry, geometry, algebra, trigonometry." When trying to express new thoughts conversation ran as follows, "You are a doctor, I am an artist, let me see, where was I, well to begin with, the point is this, I want a job, who are you anyway, I can't figure it out." At times he was silly, at other times perplexed and suspicious. No estimate could be made of his intellectual capacities, but it was likely that he showed no deterioration.

Summary

It is impossible to draw conclusions in a study of this type. However, the following brief statement of general results may prove enlightening and, as stated at the beginning of this paper, will add to the store of information pertaining to twins.

John, who received insulin therapy, and who had shown much greater disturbances in the field of motor activity, manifests a much greater degree of improvement at this time. William, who received metrazol therapy, shows improvement to the extent that he

is more tidy in personal habits, no longer wets and soils, and feeds himself satisfactorily. John has gained some degree of insight, whereas William has not improved in this respect. Physical condition is better in both, but John has shown greater gains in this respect.

John received insulin treatment 45 days within a period of 63 days. He received five injections a week, the total amount of insulin used being 7,900 units. He was comatose 35 times and had a total of 180 hours of hypoglycemia. There were no convulsions.

William received a total of 30 injections of metrazol over a period of 10 weeks. There were three injections a week. The initial dose was 3 c.c. and this dose was gradually increased to a maximum of 6.5 c.c. The total amount of metrazol given him was 172.5 c.c. During the period of treatment he experienced 18 grand mal seizures and 10 petit mal seizures. On two occasions there was no reaction.

Willard State Hospital
Willard, N. Y.

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SUBSEQUENT COURSE IN A SERIES OF FIFTY-FIVE INSULIN-TREATED PATIENTS

BY DAVID RUSLANDER, M. D.

Since the introduction of insulin treatment into this country numerous reports have appeared in the literature reflecting its almost widespread usage. Primarily because of the recent adoption of this treatment reports have been meagre concerning its efficacy over a period of months or years. Obviously of extreme importance to those interested in the treatment of acute and chronic cases of schizophrenia has been the subsequent course of treated cases. Reports have been generally favorable relative to the immediate outcome of acute cases but somewhat less favorable concerning the more chronic. Comparatively little information has as yet been available dealing with the condition of patients at various intervals subsequent to treatment. Therefore it is this latter problem with which this report is primarily concerned.

Up to the present time over 150 cases have received insulin treatment at the Buffalo State Hospital. Previously we had occasion to report "Observations in the Hypoglycemic Treatment in 55 Cases of Schizophrenia" in the American Journal of Psychiatry for May, 1938. In the present brief report we have attempted a followup study of these 55 patients for a period of one year, dating from the termination of treatment. The behavior of these patients whether on parole or within the hospital was observed and noted at regular intervals.

Although our subsequent observations cover a period of one year following treatment it is felt that the trend of the relative efficacy of insulin treatment in acute and chronic cases of schizophrenia might be indicated. Furthermore it is also believed that in this brief review an indication of the relative permanency of results obtained both in recent and chronic cases might be forthcoming.

In Table 1 the results of our series of cases over a period of one year following the treatment has been tabulated. For completeness, certain comment concerning a number of these cases are here appended:

TABLE 1

Patient	Duration of psychosis	Condition at termination of treatment	Paroled	Condition 6 months later	Condition 12 months later	Returned from parole	Discharged
S. C.	1 month	Recovered	Yes	Much imp.	Much imp.	No	Yes
L. A.	2 months	Recovered	Yes	Recovered	Recovered	No	Yes
M. G.	2 months	Recovered	Yes	Recovered	Recovered	No	Yes
T. C.	3 months	Much imp.	Yes	Much imp.	Much imp.	No	Yes
J. B.	4 months	Recovered	Yes	Recovered	Recovered	No	Yes
L. S.	6 months	Much imp.	Yes	Much imp.	Much imp.	No	Yes
R. H.	8 months	Recovered	Yes	Imp.	Imp.	Yes	No
A. W.	9 months	Recovered	Yes	Recovered	Recovered	No	Yes
D. A.	10 months	Unimp.	No	Unimp.	Unimp.	—	—
E. B.	1 year	Much imp.	Yes	Much imp.	Much imp.	No	Yes
J. E.	1 year	Much imp.	Yes	Much imp.	Recovered	No	Yes
A. F.	1 year	Recovered	Yes	Unimp.	Unimp.	Yes	—
F. T.	1 yr. 1 mo.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
L. A.	1 yr. 3 mos.	Imp.	No	Imp.	Imp.	—	—
L. P.	1 yr. 3 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
C. J.	1 yr. 5 mos.	Imp.	No	Unimp.	Unimp.	—	—
G. D.	1 yr. 6 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
W. K.	1 yr. 7 mos.	Imp.	Yes	Unimp.	Unimp.	Yes	—
F. H.	1 yr. 9 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
M. G.	1 yr. 10 mos.	Imp.	Yes	Unimp.	Unimp.	Yes	—
J. D.	2 yrs.	Imp.	Yes	Unimp.	Unimp.	Yes	—
W. B.	2 yrs. 2 mos.	Unimp.	No	Unimp.	Unimp.	—	—
R. G.	2 yrs. 5 mos.	Imp.	No	Unimp.	Unimp.	—	—
W. F.	2 yrs. 6 mos.	Imp.	Yes	Imp.	Unimp.	Yes	—
J. K.	2 yrs. 8 mos.	Much imp.	Yes	Imp.	Unimp.	Yes	—
F. A.	2 yrs. 9 mos.	Unimp.	No	Unimp.	Imp.	—	—
H. C.	2 yrs. 9 mos.	Much imp.	Yes	Much imp.	Unimp.	Yes	—
(1) W. L.	3 yrs.	Imp.	Yes	Unimp.	Much imp.	Yes	—
F. F.	3 yrs.	Unimp.	Yes	Imp.	Imp.	No	Yes
T. S.	3 yrs.	Recovered	Yes	Recovered	Recovered	No	Yes
G. M.	3 yrs. 1 mo.	Imp.	No	Unimp.	Unimp.	—	—
S. R.	3 yrs. 2 mos.	Imp.	Yes	Unimp.	Unimp.	Yes	—
J. B.	3 yrs. 2 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
M. C	3 yrs. 3 mos.	Imp.	Yes	Unimp.	Unimp.	Yes	—
M. K.	3 yrs. 3 mos.	Imp.	Yes	Much imp.	Unimp.	Yes	—
(2) Q. L.	3 yrs. 5 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes

TABLE 1—(Continued)

Patient	Duration of psychosis	Condition at termination of treatment	Paroled	Condition 6 months later	Condition 12 months later	Returned from parole	Discharged
M. G.	3 yrs. 7 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
(3)M. K.	4 yrs.	Recovered	Yes	Much imp.	Recovered	Yes	—
(4)A. V.	4 yrs. 4 mos.	Recovered	Yes	Recovered	Much imp.	Yes	—
R. H.	4 yrs. 5 mos.	Recovered	Yes	Recovered	Much imp.	Yes	—
E. H.	4 yrs. 6 mos.	Unimp.	No	Unimp.	Unimp.	—	—
W. F.	4 yrs. 6 mos.	Much imp.	Yes	Much imp.	Recovered	No	Yes
J. Z.	4 yrs. 10 mos	Much imp.	Yes	Much imp.	Much imp.	No	Yes
C. G.	5 yrs.	Imp.	Yes	Unimp.	Unimp.	Yes	—
F. M.	5 yrs. 6 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
W. S	6 yrs.	Much imp.	Yes	Imp.	Imp.	No	Yes
(5)R. U.	6 yrs.	Unimp.	No	Unimp.	Unimp.	—	—
M. H.	6 yrs. 2 mos.	Much imp.	Yes	Much imp.	Imp.	Yes	—
V. S.	6 yrs. 6 mos.	Recovered	Yes	Recovered	Much imp.	No	Yes
E. S.	6 yrs. 9 mos.	Much imp.	Yes	Much imp.	Much imp.	No	Yes
P. O.	7 yrs.	Unimp.	No	Unimp.	Unimp.	—	—
J. M.	7 yrs. 3 mos.	Imp.	No	Unimp.	Unimp.	—	—
A. S.	9 yrs.	Unimp.	No	Unimp.	Unimp.	—	—
M. S.	10 yrs. 1 mo.	Imp.	No	Unimp.	Unimp.	—	—
(6)M. S.	12 yrs.	Unimp.	No	Unimp.	Unimp.	—	—

(1) This patient, W. L., was returned from parole, having reverted to his former psychotic state. Metrazol treatment was then instituted and the patient subsequently improved and was reparoled. He is making a satisfactory adjustment at home.

(2) This man, Q. L., was discharged from parole after the expiration of the usual parole period. One month following his discharge he voluntarily returned to the hospital.

(3) M. K., this patient was discharged as recovered after his parole period of one year. Four months later he was recommitted, having had a recurrence of his psychosis. Treatment has just been completed a second time and the patient appears to have improved considerably.

(4) A. V. Voluntarily returning from parole before its expiration, this patient was given a second course of treatment with satisfactory results. He returned home and is adjusting well.

(5) Three months following completion of treatment R. U. developed pulmonary tuberculosis.

(6) Four months following treatment, M. S. likewise developed pulmonary tuberculosis.

TABLE 2

	At termination of treatment	Paroled	Condition one year later	Discharged
Recovered	12	12	8	7
Much improved	19	19	18	16
Improved	15	6	6	0
Unimproved	9	1	23	1
Total	55	38	55	24

Table 2 is a composite summary of the results of our original series of 55 cases a year following termination of treatment.

CONCLUSIONS

1. A series of 55 patients treated with insulin were observed for a period of one year following treatment.

2. A total of 24 patients of this series were discharged at the expiration of one year parole.

3. In cases where the duration of psychosis is less than one year improvement is more prone to occur. Furthermore in our experience such improvement tends to be sustained at least over a period of one year.

4. It would appear that patients in whom the duration of psychosis is greater than 18 months show but moderate improvement as a result of treatment. Furthermore we are impressed with the failure of these patients to retain their improvement for any length of time. In the great majority of these cases the patients tend to revert to their former psychotic state.

5. Two patients of this series subsequently developed pulmonary tuberculosis.

Buffalo State Hospital
Forest Avenue
Buffalo, N. Y.

TREATMENT OF SCHIZOPHRENIA WTIH SYMPATHOMIMETIC DRUGS: BENZEDRINE SULFATE*

BY EUGENE DAVIDOFF, M. D., AND EDWARD C. REIFENSTEIN, JR., M. D.

In December, 1935, Prinzmetal and Bloomberg[1] directed attention to the stimulating effect of oral ingestion of the hydrochloride salt of benzedrine (racemic beta-phenylisopropylamine) on the central nervous system of patients with narcolepsy, and found this drug to be approximately three times as effective as ephedrine. In January, 1936, following these observation, one of the present authors began a comparative study of the alterations produced by these two pseudosympathomimetic drugs in the mental and physiologic state of both normal and psychotic persons. A report on the psychic response of 22 catatonic schizophrenics has been previously published in the PSYCHIATRIC QUARTERLY,[2] October, 1936. About the same time, Myerson[3] studied the physiologic action of benzedrine in 18 patients with dementia præcox. He stated briefly that the drug had apparently no beneficial effect in catatonic states or hebephrenia. Guttmann, et al,[4] administered the drug to normal and depressed patients for its hypertensive action, later extending their observations to patients with dementia præcox.

Since these original observations, the use of benzedrine in cases of schizophrenia has been reported by: Davidoff and Reifenstein;[5] Carlisle and Hecker;[6] Wilbur, et al;[7] Bloomberg;[8] Reiter;[9] Schube, et al;[10] Donley;[11] and Wooley.[12] All of the medication used since Prinzmetal and Bloomberg's original work has been in the form of the sulfate salt, which apparently produces results identical with the hydrochloride.[13] The drug was given by mouth in all of the studies except those of Myerson[3] and Schube[10] who administered Benzedrine Sulfate subcutaneously in some instances.

The work initiated at Manhattan State Hospital has been continued by us in greater detail at the Syracuse Psychopathic Hospital. In addition to oral administration, a method of intravenous therapy has been evolved during the past three months.

*Read before the Interhospital Conference of the ew York "Up-State" Hospitals, Marcy State Hospital, Marcy, N. Y., April 23, 1938.

Method of Procedure*

Oral Benzedrine Sulfate

After a period of careful physical and mental observation each patient received daily an oral dose of 10 to 30 mgs. of Benzedrine Sulfate for periods varying from 10 days to 3 months, except in instances where the drug had to be prematurely discontinued. The method of investigation has been previously reported.[2, 5, 14]

Intravenous Benzedrine Sulfate and Oral Sodium Amytal

After a period of careful physical and mental observation during which an oral test dose of sodium amytal was administered, each patient received on the first day 10 mgs. of Benzedrine Sulfate intravenously. The physiologic and psychologic responses were closely observed for 12 to 16 hours thereafter. The following day the patient received sodium amytal orally in doses of 0.1 to 0.2 gm. repeated every hour until narcosis was obtained. This was allowed to terminate spontaneously. The third day Benzedrine Sulfate 30 mgs. was injected intravenously, and on the fourth day amytal narcosis was again induced by oral administration. This program of alternating stimulation with 30 mgs. of Benzedrine Sulfate intravenously, and narcosis with sodium amytal orally was continued for two to three weeks. In general 0.6 to 0.9 gm. of sodium amytal was required to produce narcosis.

Criteria for Judging Improvement

The following factors were taken into consideration in designating a patient as improved:

(a) The opinion of staff members who frequently were unaware of the medication or procedure employed in a given case.

(b) The response as compared with the control cases mentioned later.

(c) The total coordinate reaction of the individual, rather than the response in any particular phase, or at any particular time. Transitory amelioration of symptoms was not considered improvement.

*We are indebted to Loretta Loffin, R. N., Helen B. Powers, R. N., and Mary Quinlan, R. N., for technical assistance; and to Smith, Kline and French Laboratories, Philadelphia, for Benzedrine Sulfate tablets and intravenous ampules.

(d) Eligibility for parole, improvement in coordination of mood, speech and motor activity, improved insight, increase in general efficiency and accessibility, and decrease in asocial behavior were the criteria used in classifying a patient as *much improved.*

(e) Improvement in social adaptability; moderate increase in general efficiency, accessibility, speech and motor activity; with less pronounced improvement in mood and coordination of activity, were considered in designating a patient as *improved.*

(f) Minimal improvement in coordination of activity and social adaptability, with or without response in any particular phase was considered in rating a patient as *slightly improved.* Increased accessibility alone was not considered to represent improvement.

Results

Oral Benzedrine Sulfate

Benzedrine Sulfate was administered by mouth to 45 self-absorbed patients with dementia præcox. The response is illustrated in Tables 1 and 2.

(a) Catatonic Group. There were 32 cases in this group, 12 of whom (37 per cent) showed improvement. Most striking was the finding that 9 of the 14 cases ill less than two years improved, while only 3 of 18 cases of more than two years duration improved. Increased accessibility was found in all the 12 improved cases, and in 2 others. Increased general efficiency was observed in 13, increased motor activity in 15, increased speech activity in 11, elevation of mood in 7, and a state of increased irritation in 6. Increased drive and spontaneous conversation appeared in 3 cases. Catalepsy disappeared completely in 2 patients, and temporarily in a third; two mute patients began to talk, but one lapsed into silence again after a few hours and subsequently showed no further speech activity. Six patients showed an increase in asocial behavior consisting of assaultive tendencies in 4, increased negativism in 1, and a homicidal attempt by 1 patient.

(b) Hebephrenic and Paranoid Groups. Only one of five hebephrenic patients receiving Benzedrine Sulfate showed improvement. This patient uncovered her delusions and changed from a morose to a silly mood, but did not exhibit an improvement in her inadequate central affective tendency.

TABLE 1. EFFECT OF ORAL ADMINISTRATION OF BENZEDRINE SULFATE: DEMENTIA PRÆCOX

Self-Absorbed Catatonic Group

Case number and constitution			Duration of illness: Under 2 years	Duration of illness: Over 2 years	Clinical condition**	Accessibility	General efficiency	Motor activity	Speech activity	Coordination of mood	Irritability	Asocial behavior	Miscellaneous
1.	J. G.	Asthenic	x	..	xx	x	x	x	x	x	..	..	Increased drive, spontaneous conversation
2.	M. B.	Asthenic	x	..	xx	x	x	x	x	x	..	..	
3.	V. C.	Pyknic	x	..	xx	x	x	x	x	x	x	..	
4.	R. R.	Pyknic*	x	..	xx	x	x	x	x	x	x	..	Increased drive, spontaneous conversation
5.	J. K.	Asthenic*	x	..	xx	x	x	x	x	x	..	..	
6.	S. S.	Pyknic*	..	x	xx	x	x	x	x	x	sl.	..	Increased drive, spontaneous conversation
7.	B. F.	Pyknic	..	x	x	x	x	x	x	sl.	x	..	Transitory volubility and hyperactivity
8.	G. P.	Asthenic	x	..	x	x	x	x	x	..	..	..	Catalepsy, mutism and amnesia disappeared
9.	W. M.	Asthenic	x	..	x	x	x	..	x	..	..	..	
10.	F. M.	Asthenic	x	..	x	x	x	x	..	..	x	..	
11.	V. M.	Asthenic	..	x	sl.	x	sl.	x	x	..	x	..	
12.	L. P.	Asthenic*	x	..	sl.	x	sl.	x	x	..	x	..	
13.	J. C.	Asthenic	..	x	..	..	sl.	x	..	..	..	..	Catalepsy disappeared
14.	F. G.	Asthenic	..	x	..	..	..	x	..	..	..	..	
15.	J. R.	Asthenic*	x	..	..	..	..	x	..	..	..	..	
16.	G. S.	Asthenic*	x	..	..	..	..	x	..	..	x	x	Homicidal attempt
17.	W. T.	Asthenic	..	x	..	..	..	..	..	..	..	..	
18.	F. G.	Pyknic	..	x	..	..	..	..	..	..	x	x	Assaultive
19.	A. G.	Dyplastic	..	x	..	..	..	..	..	..	..	..	Transitory disappearance of catalepsy and mutism
20.	K. G.	Asthenic	x	..	..	..	..	..	..	..	x	x	Assaultive
21.	F. M.	Asthenic	..	x	..	..	..	..	..	..	..	..	
22.	J. O.	Asthenic	..	x	..	..	..	..	..	..	x	x	Assaultive; uncovered delusional content
23.	F. L.	Pyknic	..	x	..	..	..	..	..	..	..	..	
24.	W. O.	Pyknic	..	x	..	..	..	..	..	..	..	..	
25.	W. H.	Asthenic	..	x	..	..	..	..	..	..	..	..	
26.	S. F.	Dyplastic	..	x	..	..	..	..	..	..	x	x	Assaultive
27.	J. N.	Asthenic	..	x	..	..	..	..	..	..	..	..	
28.	P. H.	Asthenic	..	x	..	..	..	..	..	..	..	..	
29.	W. W.	Pyknic*	..	x	..	x	..	..	..	..	..	..	Uncovered delusional content
30.	S. H.	Asthenic*	..	x	..	..	..	..	..	..	x	x	Increased negativism
31.	L. R.	Asthenic*	x	..	..	..	..	..	..	..	..	..	
32.	M. C.	Asthenic*	x	..	..	x	..	..	..	..	..	..	
Positive results			14	18	12	14	13	15	11	7	13	6	

*Cases studied at Syracuse Psychopathic Hospital; others were observed at Manhattan State Hospital.

**Clinical condition: xx—much improved, x—improved (social improvement), sl.—slightly improved.

In other items: xx—greatly increased, x—moderately increased, sl.—slightly increased.

TABLE 2. EFFECT OF ORAL ADMINISTRATION OF BENZEDRINE SULFATE: DEMENTIA PRÆCOX

Self-Absorbed Hebephrenic and Paranoid Group

Case number and constitution	Duration of illness: Under 2 years	Duration of illness: Over 2 years	Clinical condition	Accessibility	General efficiency	Motor activity	Speech activity	Coordination of mood	Irritability	Asocial behavior	Miscellaneous
Hebephrenic group											
1. A. P. Dyplastic	x	..	x	x	x	x	x	x	sl.	..	Revealed delusions; affect inadequate
2. J. S. Asthenic	..	x	..	sl.	..	x	x	..	..	..	
3. T. M. Pyknic	..	x	..	..	..	..	..	..	x	..	
4. A. C. Asthenic	..	x	..	..	..	..	..	..	..	..	
5. O. R. Asthenic	x	..	..	..	..	..	..	..	x	..	
Positive Results	2	3	1	2	1	2	2	1	3	0	
Paranoid Group											
1. J. K. Asthenic	..	x	x	x	x	x	x	x	..	..	Discussed delusions with more insight
2. R. F. Asthenic	x	..	sl.	x	x	x	sl.	..	..	..	Uncovered hallucinations
3. H. B. Pyknic	..	x	..	sl.	..	..	x	..	..	sl.	Uncovered suspicions and delusions
4. H. C. Asthenic	x	..	..	x	..	x	x	sl.	x	sl.	Revealed delusions; less cooperative
5. I. L. Asthenic	x	..	..	sl.	..	x	sl.	..	..	..	
6. J. H. Dyplastic	..	x	..	..	sl.	..	..	..	x	..	More elaboration of delusions
7. B. W. Asthenic	..	x	..	..	..	..	..	..	..	..	
8. V. M. Pyknic	..	x	..	sl.	..	x	sl.	..	..	..	
Positive Results	3	5	2	6	3	5	6	2	2	2	

Eight paranoid schizophrenics were treated, only two of whom showed improvement. One discussed his delusions more freely with greater insight. Six patients showed both increased accessibility and increased speech activity, and these tended to uncover and amplify their delusions and hallucinations so that their problems became more understandable to us. Two patients had improvement of mood, 2 a state of increased irritation, and 2 increased asocial behavior consisting of increased suspicion and less cooperation.

Intravenous Benzedrine Sulfate and Oral Sodium Amytal

Benzedrine Sulfate intravenously and sodium amytal orally were administered to 12 patients with dementia præcox, including 6 self-absorbed and 6 excited cases. Catatonic, hebephrenic and paranoid types were treated. The results are illustrated in Table 3.

TABLE 3. EFFECT OF ALTERNATING INTRAVENOUS BENZEDRINE SULFATE WITH ORAL SODIUM AMYTAL ON DEMENTIA PRÆCOX

Catatonic, Hebephrenic and Paranoid Groups

Case number			Duration of illness		Clinical condition‡	Accessibility	General efficiency	Motor activity	Speech activity	Coordination of mood	Irritability	Asocial behavior	Miscellaneous
			Under 2 years	Over 2 years									
1.	S. B.	Asthenic (catatonic)	x	..	xx	x	x	x	x	x	..	..	
2.	R. T.	Asthenic* (catatonic)	x	..	xx	x	x	x	x	x	x	..	Insight much improved
3.	P. G.	Asthenic* (catatonic)	x	..	x	x	sl.	x	sl.	x	..	..	
4.	E. B.	Pyknic (hebephrenic)	x	..	x	x	x	x	x	x	..	..	
5.	W. S.	Asthenic (hebephrenic)	..	x	x	x	x	x	x	x	x	..	Hypochondriasis diminished
6.	L. M.	Pyknic (catatonic)	x	..	sl.	sl.	sl.	sl.	sl.	sl.	sl.	..	
7.	I. T.	Asthenic (catatonic)	..	x	sl.	sl.	..	..	x	sl.	sl.	..	Mutism disappeared
8.	G. K.	Asthenic (catatonic)	x	..	sl.	sl.	sl.	sl.	sl.	sl.	..	..	Insight improved
9.	K. H.	Asthenic (paranoid)	..	x	..	sl.	..	sl.	x	..	x	sl.	Increased negativism
10.	H. O.	Asthenic (paranoid)	..	x	..	x	sl.	x	sl.	sl.	..	..	Delusions more systematized
11.	E. C.	Pyknic (catatonic)	x	..	..	..	..	..	..	..	sl.	..	
12.	C. A.	Pyknic (catatonic)	x	..	..	..	..	..	..	..	x	x	Suicidal attempt; assaultive, attacked attendant; increased anxiety
Positive results			8	4	8	10	8	9	10	9	7	2	

*We are indebted to Dr. Albert S. Siewers for observations on these cases after discharge.

‡Clinical condition: xx—much improved, x—improved (social improvement), sl.—slightly improved.

In other items: xx—greatly increased, x—moderately increased, sl.—slightly increased.

Of the 12 cases, 8 showed improvement, 6 of whom had been ill less than two years. Increased accessibility was noted in 10; increased general efficiency in 8; increased motor activity in 9; increased speech activity in 10; improvement in mood in 9, and a state of increased irritation in 7. An increase in asocial behavior was noted in 2 patients, one of whom became extremely irritable and negativistic, while the other attempted suicide and then attacked an attendant. Mutism disappeared in one patient, hypochondriasis diminished in another, and the delusions became more systematized in a third.

Because these observations of necessity do not extend over a period of more than two months, it is admitted that the favorable results may indicate only a temporary fluctuation in the course of the illness. A subsequent moderate recession in Cases 4, 5 and 6 has been reported to us.

TABLE 4. EFFECT OF BENZDRINE SULFATE ON DEMENTIA PRÆCOX

Distribution of Results According to Duration of Illness

Method of administration, duration of psychosis, type of psychosis	Number of cases	Clinically improved	Increased accessibility	Increased general efficiency	Increased motor activity	Increased speech activity	Improved coordination of mood	Increased state of irritation	Increased asocial behavior
Oral regime									
Under 2 years duration									
Catatonic	14	9	10	9	10	8	5	6	2
Hebephrenic	2	1	1	1	1	1	1	2	0
Paranoid	3	1	3	1	3	3	1	1	1
Total	19	11	14	11	14	12	7	9	3
Over 2 years duration									
Catatonic	18	3	4	4	5	3	2	7	4
Hebephrenic	3	0	1	0	1	1	0	1	0
Paranoid	5	1	3	2	2	3	1	1	1
Total	26	4	8	6	8	7	3	9	5
All cases oral regime	45	15	22	17	22	19	10	18	8

TABLE 5. EFFECT OF BENZEDRINE SULFATE ON DEMENTIA PRÆCOX

Distribution of Results According to Duration of Illness

Method of administration and duration of psychosis	Number of cases	Clinically improved	Increased accessibility	Increased general efficiency	Increased motor activity	Increased speech activity	Improved coordination of mood	Increased state of irritation	Increased asocial Behavior
Intravenous regime (with oral sodium amytal)									
Under 2 years duration	8	6	6	6	6	6	6	4	1
Over 2 years duration	4	2	4	2	3	4	3	3	1
All cases intravenous regime	12	8	10	8	9	10	9	7	2
Both regimes									
Under 2 years duration									
Oral	19	11	14	11	14	12	7	9	3
Intravenous	8	6	6	6	6	6	6	4	1
Total	27	17	20	17	20	18	13	13	4
Over 2 years duration									
Oral	26	4	8	6	8	7	3	9	5
Intravenous	4	2	4	2	3	4	3	3	1
Total	30	6	12	8	11	11	6	12	6
All cases both regimes	57	23	32	25	31	29	19	25	10

ANALYSIS OF RESULTS

When the results of both forms of administration were analyzed according to length of illness it was observed that the patients with dementia præcox of less than two years duration were affected beneficially with much greater consistency than those who had been ill for longer periods of time. These results are indicated in Tables 4, 5 and 6. There were 27 cases under two years duration treated by both methods, and of these 17, or 63 per cent, were improved. Of the 30 cases over two years duration, only 6, or 20 per cent, were improved.

Fifty-eight per cent of the cases of shorter duration receiving Benzedrine Sulfate orally were improved, while only 15 per cent of those of longer duration were beneficially affected. The response of the early cases was apparently more marked in the small group receiving the intravenous regime, 75 per cent of whom were improved.

When the 45 cases treated by the oral regime were considered, regardless of duration, 15, or 33 per cent, showed improvement. Of 12 cases treated by the intravenous regime, 8, or 67 per cent, were improved. Of the entire series of 57 cases, 23, or 40 per cent, showed improvement.

Comparison with Controls

At the suggestion of Dr. Harry A. Steckel, a number of procedures were undertaken in order to provide adequate data with which to control the observations on the effectiveness of Benzedrine Sulfate. These are illustrated in Table 7.

The oral administration of Benzedrine Sulfate was compared with the effect of ephedrine sulfate orally in 22 catatonic patients for one week. Transitory improvement was noted in 3, or 13 per cent, but the response was much more uncertain than with Benzedrine Sulfate. The same group of patients then received lactose for one week with no variation in their usual state. These patients were subsequently given Benzedrine Sulfate, and the cases which had evinced some response to ephedrine were among those more favorably influenced by Benzedrine Sulfate.

Prior to instituting the procedure of intravenous Benzedrine Sulfate alternating with oral sodium amytal, we administered a single dose of 10 mgs. of Benzedrine Sulfate intravenously in 15 patients with dementia præcox. The physiologic and psychologic responses that resulted were found to correspond in general to the responses usually obtained following oral administration, except that these reactions were more rapidly established and slightly more intense. No unexpected toxic effects were encountered. Daily doses of 30 mgs. of Benzedrine Sulfate intravenously given to six self-absorbed patients for one week produced no additional hazard and resulted in a rapid improvement in three of them. These patients were subsequently given Benzedrine Sulfate intravenously and sodium

TABLE 6. EFFECT OF BENZEDRINE SULFATE ON DEMENTIA PRÆCOX

Comparison with Control Dementia Præcox Cases

Method of administration and duration of psychosis	Number of cases	Much improved	Improved	Slightly improved	Unimproved or worse	Total cases favorably influenced	
						Number	Per cent
Benzedrine Sulfate							
Oral regime							
(a) Under 2 years duration	19	5	4	2	8	11	58
(b) Over 2 years duration	26	1	2	1	22	4	15
(c) Total	45	6	6	3	30	15	33
(d) Total catatonics	32	6	4	2	20	12	37
Intravenous regime (With oral sodium amytal)							
(a) Under 2 years duration	8	2	2	2	2	6	75
(b) Over 2 years duration	4	0	1	1	2	2	50
(c) Total	12	2	3	3	4	8	67
(d) Total catatonics	8	2	1	3	2	6	75
Both regimes							
(a) Under 2 years duration	27	7	6	4	10	17	63
(b) Over 2 years duration	30	1	3	2	24	6	20
(c) Total	57	8	9	6	34	23	40
(d) Total catatonics	40	8	5	5	22	18	45

amytal orally. A preliminary dose of 0.1 to 0.2 gm. of sodium amytal was given orally to all patients who were to be placed on the combined intravenous Benzedrine Sulfate and oral sodium amytal regime, which resulted in the elimination of two patients because of unfavorable response (idiosyncrasy). Twenty-five patients were given oral sodium amytal in large doses daily with improvement in 8, or 32 per cent. Another group of six patients received intravenous saline alternating daily with oral lactose for one week. This resulted in improvement in one patient. The effect of intravenous

TABLE 7. EFFECT OF BENZDRINE SULFATE ON DEMENTIA PRÆCOX

Comparison with Control Dementia Præcox Cases

Various regimes with control group and catatonic patients	Number of cases	Much improved	Improved	Slightly improved	Unimproved or worse	Total cases favorably influenced	
						Number	Per cent
Control cases							
Oral regime: catatonic group							
(a) Ephedrine Sulfate‡	22	0	1	2	19	3	13
(b) Lactose‡	22	0	0	0	22	0	0
Intravenous regime: dementia præcox all types							
(a) Intravenous Benzedrine Sulfate alone	6	2	1	0	3	3	50
(b) Oral sodium amytal alone*	25	2	3	2	17	8	32
(c) Intravenous saline and oral lactose‡	6	0	0	1	5	1	16
Routine hospital procedures: catatonic group							
(a) Under 2 years duration							
Self-absorbed	25	1	2	4	18	7	28
Excited	25	2	2	2	19	6	24
Total	50	3	4	6	37	13	26
(b) Over 2 years duration†	25	3	3	2	17	8	32
(c) Total catatonic group	75	6	7	8	54	21	28
Routine hospital procedure:							
Dementia præcox, all types	300	8	24	41	227	73	24

*For additional statistics see Palmer and Braceland.—Ref. 15.

‡Response estimated for one week, after which Benzedrine Sulfate was given.

†Including spontaneous remissions.

Benzedrine Sulfate on narcosis produced by intravenous sodium amytal was studied in 10 patients. The results, reported in detail elsewhere,[16] revealed a partial antagonism between the two drugs, with a decrease in the duration and in the depth of the narcosis in every case.

In order to determine the effect of the usual routine procedures employed in the Syracuse Psychopathic Hospital on patients with dementia præcox, a series of consecutive admissions were analyzed for improvement. In 75 cases of catatonic dementia præcox, regardless of duration, 28 per cent showed improvement. Improvement was noted in 26 per cent of 50 cases under two years duration (in 28 per cent of 25 self-absorbed cases and in 24 per cent of 25 excited cases). Including spontaneous remissions, 32 per cent of 25 cases over two years duration showed improvement. In a series of 300 consecutive cases of dementia præcox of all types regardless of duration of illness 73, or 24 per cent, were recorded as improved.

TABLE 8. EFFECT OF ORAL BENZEDRINE SULFATE ON DEMENTIA PRÆCOX

*Comparison with Persons with Other Types of Mental Illness and with Normal Individuals**

Type of psychosis	Number of cases	Improvement		Increased general efficiency		Increased motor activity		Increased speech activity		Elevation of mood	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Dementia præcox	45	15	33	17	39	22	49	19	42	10	22
Organic	10	5	50	8	80	8	80	7	70	5	50
Manic-depressive	10	3‡	30	6	60	6	60	6	60	2†	20
Psychoneurotic	10	3‡	30	2	20	4	40	6	60	3	30
Normal	10	..	..	10	100	10	100	7	70	7	70

*Previously published results.—Ref. 5.

‡Accelerated rate of improvement of mood.

†A state of increasing irritation was noted in 60 per cent of the manics.

COMPARISON WITH PERSONS WITH OTHER TYPES OF MENTAL ILLNESS AND WITH NORMAL INDIVIDUALS

Our previous studies [2, 5, 14] have demonstrated that Benzedrine Sulfate tends to produce a greater increase in motor activity, speech activity, and general efficiency than in mood elevation regardless of the type of mental illness. These observations are indicated in Table 8. It will be noted that only 10 of the 15 schizophrenic patients who were improved following oral administration

of the drug showed elevation or improvement in mood. The drug appears to be most effective in normal persons, and of more value in individuals with organic depression, particularly in alcoholics, than in patients with depression or retardation of psychogenic origin.

Rationale of Therapy

It is well established that the action of Benzedrine Sulfate includes stimulation of the central nervous system. As stated in our previous publications, the stimulating effect of Benzedrine Sulfate on the entire sympathetic nervous system (i. e., the pseudosympathomimetic effect) must also be considered in evaluating the action of this drug. We pointed out that the response of an individual to Benzedrine Sulfate must be assumed to represent the reaction of the whole organism, and therefore to include the reaction of the parasympathetic system as well. The observations of Pavlov[17] on positive and negative induction and of Sherrington[18] on immediate and successive induction as part of the integrative action of the nervous system were recalled in this connection.[14] In these papers we drew attention to the difficulty in evaluating and discriminating between the psychologic and the physiologic reactions to the drug.

Because of the central stimulating action of Benzedrine Sulfate we originally avoided administering it to excited patients, and restricted its use to depressed schizophrenics. More recently, however, we have employed the combination of Benzedrine Sulfate intravenously and sodium amytal orally for the following reasons:

1. It rendered all types of schizophrenics amenable to treatment with Benzedrine Sulfate, because the amytal narcosis produced sufficient depression in excited individuals so that Benzedrine Sulfate could then be administered.

2. It enabled us to utilize the recognized increased accessibility produced by continuous sodium amytal narcosis[19] in combination with the augmented accessibility resulting from the stimulating action of Benzedrine Sulfate[5] (synergistic action).

3. It allowed us to administer Benzedrine Sulfate intermittently thus avoiding the development of tolerance to the drug.

4. It permitted us to alternate depression with stimulation of the central nervous system rapidly, without the necessity of counteracting the effect of either drug. This produced in the central nervous system, we believe, a cycle of alternating "positive and negative shocks," which is represented graphically in Figure 1.

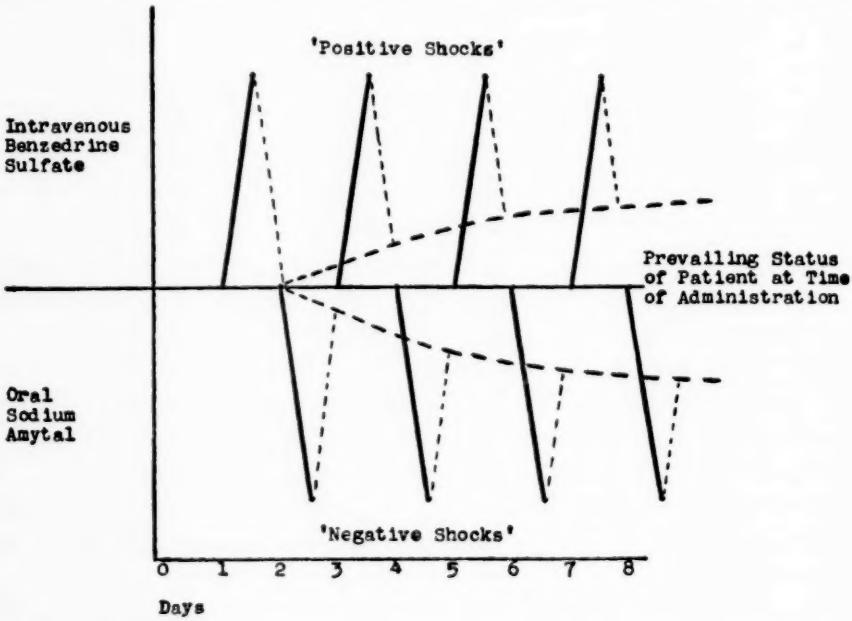
'Positive Shocks'
Intravenous Benzedrine Sulfate
Prevailing Status of Patient at Time of Administration
Oral Sodium Amytal
'Negative Shocks'
0 1 2 3 4 5 6 7 8
Days

Figure I : Rationale of Alternate Intravenous Benzedrine Sulfate and Oral Sodium Amytal in Dementia Precox

We are at present attempting to vary the cycle of alternating positive and negative shocks to correspond with the prevailing status of the individual at a given time, either by repeating the injection of Benzedrine Sulfate on consecutive days, and thereby elevating the prevailing state, or by repeating the ingestion of sodium amytal on consecutive days and producing a depression of the prevailing state.

On the basis of the theories of Jackson,[20] Head,[21] Pavlov,[17] Sherrington,[18] Kempf,[22] Freud,[23] Rivers,[24] Jung,[25] and Meyer[26] we might postulate that the synergistic therapy of alternating stimulation with Benzedrine Sulfate and depression with sodium amytal at-

tempts to produce pseudostimulation of the autonomic nervous system and repressed lower center functions, and to produce at the same time a more coordinate action of the integrated functions of the central nervous system. This does not imply modification of the total personality, but suggests rendering a given personality more adaptable in a given environmental situation by increasing the number of available pathways of coordinate action. We recognize that the drugs employed may not be ideal for these objectives.

Levy Simpson[27] of London has suggested that "the therapeutic stimulating effect of insulin hypoglycemia in schizophrenia may be partly due to the secretion of epinephrine, which may continue for some hours. If so, this therapy would be comparable to that of benzedrine."

Pharmacologic Physiology

A review of the literature and of our own studies on the pharmacologic physiology of Benzedrine Sulfate reveals considerable controversial data which cannot be presented here because of its detailed nature. A summary, admittedly arbitrary, of the more pronounced effects produced by the drug includes:

1. Nervous System and Mental Functions—usually stimulated.
2. Cardiovascular System—blood presure usually elevated; pulse rate increased or decreased depending not infrequently on whether the subject is ambulatory or recumbent; heart not consistently affected, although infrequent disturbances of rhythm and conduction, and precordial pain have been recorded.
3. Gastrointestinal System—spasm usually relaxed, although other inconsistent phenomena have been described.
4. Upper Respiratory Tract—decongestion of mucosa from inhalation of benzedrine vapor; little significant effect from internal administration of Benzedrine Sulfate.
5. Basal Metabolic Rate—not infrequently moderately elevated initially for a short period.
6. Eye—cycloplegia produced from instillation of the solution or from internal administration.
7. Weight—not infrequently mildly reduced during initial periods of administration, but usually not sufficiently affected to be clinically significant.

8. Skin, Mucous Membranes and Vasomotor System—variably affected: flushing of the face, excessive sweating, dryness of the mouth and coldness and clamminess of the hands particularly noted.

9. Habitus—sensitivity apparently increased in asthenic persons.

10. Miscellaneous—no definite effect established on the following: respiration, genito-urinary tract, bronchi, hematopoietic system, chemical elements of the blood, spinal fluid, urine, stool, deep reflexes, temperature, and carotid sinus.

The pattern of reaction of these physiologic responses is variable, uncertain, unpredictable, and at times paradoxical depending upon the individual medicated and the opinion of the interpreter.

Conclusions

1. Benzedrine Sulfate merits further investigation in the treatment of schizophrenia. Preliminary results indicate an improvement in 40 per cent of 57 cases herein reported.

2. The methods of treatment described in this paper include:

(a) Use of Benzedrine Sulfate alone, either orally or intravenously, which necessarily is limited to self-absorbed cases.

(b) Use of Benzedrine Sulfate intravenously in combination with sodium amytal orally, which is applicable to self-absorbed and excited cases.

3. Long-continued observations of a large series of patients correlated with adequate control studies will be necessary before we can determine the value of the Benzedrine Sulfate procedures. The favorable results thus far encountered may be due to the short period of observation, particularly in the combined therapy. Until recoveries from dementia præcox are recorded as "5 and 10-year cures," as is done in estimating the response in neoplastic disease, we will be unable properly to evaluate the real worth of any of the pharmacotherapeutic procedures now in vogue. Further, the value of large doses over longer periods of administration must be investigated.

4. The psychic effect of the increased attention to the patient entailed in the Benzedrine Sulfate procedures and other similar regimes cannot be disregarded.

5. Benzedrine Sulfate appears to be more effective in (a) the early cases, (b) the catatonic types, and by (c) the intravenous regime as reported.

6. Benzedrine Sulfate may be of value in:

(a) Rendering patients more adaptable and more accessible to understanding, investigation and psychotherapy.

(b) Arriving at a differential diagnosis, particularly between schizophrenic and alcoholic psychoses.

(c) Indicating to some degree the plasticity and integration of the personality.

(d) Promoting more coordinate activity.

7. Although certain untoward reactions in the course of benzedrine administration occasionally occur and at times counterbalance the beneficial effects, in general the regimes herein described are easy to administer and seem to present less of the dangers and difficulties encountered in some other pharmotherapeutic procedures.

8. In those cases of schizophrenia which are inherently capable of being stimulated to some degree of improvement, Benzedrine Sulfate may initiate, accelerate, augment and/or indicate such improvement.

Syracuse Psychopathic Hospital
708 Irving Avenue
Syracuse, N. Y.

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LITERACY AND MENTAL DISEASE

BY BENJAMIN MALZBERG, PH.D.

We are frequently asked whether there is any relation between education and the probability of developing a mental disorder. Just what relation one should expect is not always apparent on the surface. Some investigators seem to think that, at least within certain limits, increasing degrees of education should be associated with better mental health. Others, on the contrary, feel that the processes of formal education detract from the "natural" man, and, by refining his sensibilities and increasing his wants, make him a readier victim to mental frustrations of all kinds. The obvious approach to the problem is to grade the general population according to degree of education, and to compute annual rates of first admissions to hospitals for mental disease for each educational class. Unfortunately, though we possess such data for mental patients, there are none for the general population; and a thorough investigation of the problem must therefore await the improvement of educational statistics.

In the meantime, we are able to make a preliminary contribution to the subject by considering the problem of literacy. It is possible to divide the population into two groups, namely, those who can at least read and write, and those who are illiterate. Within these broad categories, we can determine the relative prevalence of mental disease. To do so, we shall consider all first admissions, aged 10 years and over, to all state and licensed institutions for mental disease in New York State during the three fiscal years ended June 30, 1931. The age limitation is taken in view of the fact that the United States Bureau of the Census defines an illiterate as one who is 10 years of age and over, who is unable to read and write in English or in some other language.[1]

There were 15,875 male first admissions to the above hospitals during the three fiscal years 1929-1931. Of these, 14,925, or 94.0 per cent, were literate, and 950, or 6.0 per cent, were illiterate. The average annual rates of first admissions were 97.7 and 191.6 per 100,000 of corresponding general population. The rate of first admissions among the illiterates was therefore in excess by 96.1 per cent.

A part of this excess results, however, from age differentials. The median ages of the literate and illiterate male populations of New York State on April 1, 1930 were 33.6 and 47.6 years, respectively. As the rate of first admissions is correlated with age, we should therefore expect a higher rate among the illiterates, other things being equal. We may allow for the age differentials by standardizing the rates of first admissions. Using the population of New York State, aged 15 years and over on April 1, 1930 as the standard, we obtain standardized rates of 110.3 and 173.0 per 100,000 population for the literates and the illiterates, respectively. The latter rate is in excess by 56.8 per cent, as contrasted with an excess of 96.1 per cent on the basis of "crude" rates. Thus, even when age differences are eliminated, it is still evident that mental diseases are much more prevalent among the illiterate population. Perhaps a further correction should be made in view of the fact that the classification of the general population by the United States Census Bureau with respect to literacy was based merely upon the answer of Yes or No to the census enumerator in reply to the question "Whether able to read and write." Obviously, many persons probably concealed their illiteracy with an affirmative answer. Such an error results in an increase of the number of literates and a consequent reduction in their rate of first admissions. It also results in increasing the rate of the illiterate population. But it is hardly likely that such an error could be large enough to affect the relative order of the two rates.

TABLE 1. FIRST ADMISSIONS TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, AGED 10 YEARS AND OVER, DURING THE FISCAL YEARS 1929-1931, CLASSIFIED ACCORDING TO LITERACY

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	75	55	4	4	4.6	3.4	100.5	125.7
15-24	2,128	1,514	35	15	66.0	45.1	152.2	54.9
25-34	2,873	2,382	82	64	88.9	73.6	141.4	74.1
35-44	3,159	2,447	223	215	106.7	89.8	172.6	122.7
45-54	2,463	1,872	241	203	118.2	96.8	189.1	125.0
55-64	1,834	1,350	150	163	144.3	107.1	180.0	140.0
65 and over ..	2,381	2,053	213	327	274.4	212.8	303.8	329.2
Unknown	12	13	2	3	....	....	....	....
Total	14,925	11,686	950	994	97.7	77.4	191.6	148.2

TABLE 2. STANDARDIZED RATES OF FIRST ADMISSIONS TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, 1929-1931, PER 100,000 POPULATION AGED 15 YEARS AND OVER, CLASSIFIED ACCORDING SEX, RACE, NATIVITY AND LITERACY*

Race, nativity and parentage	Males				Females			
	Literate		Illiterate		Literate		Illiterate	
	Number	Rate per 100,000 population	Number	Rate per 100,000 population	Number	Rate per 100,000 population	Number	Rate per 100,000 population
Total population	14,937	110.3± 1.0	952	173.0± 6.9	11,686	87.0± 0.9	994	112.1± 4.8
White	13,976	106.8± 1.0	843	157.3± 6.7	10,898	83.9± 0.9	928	106.3± 4.7
Native of native parentage	3,787	84.2± 1.5	88	266.1±33.2	3,105	67.5± 1.3	58	201.5±32.3
Native of foreign or mixed parentage	4,381	114.8± 1.8	67	281.5±41.2	3,637	90.6± 1.5	63	279.5±41.3
Foreign	5,519	120.0± 1.9	678	131.8± 6.6	3,977	95.9± 1.8	797	95.4± 4.6
Negro	890	230.4± 8.0	95	771.8±92.9	785	182.2± 6.9	65	398.5±62.9

*The population used as standard was that of New York State, aged 15 years and over on April 1, 1930.

There are other factors to be considered, however. The rate of first admissions will be influenced by the makeup of the general population with respect to nativity and race. We must consider separately such populations as foreign whites and negroes, among whom illiteracy is relatively more prevalent than among the remainder of the population, and who therefore appear in disproportionate numbers among the illiterate population. Table 2 shows standardized rates of first admissions per 100,000 population for the native and foreign white populations, and for negroes.

Among native whites of native parentage the illiterates and literates had standardized rates of 266.1 and 84.2, respectively, the former being in excess by over 200 per cent. Among native whites of foreign or mixed parentage the standardized rates were 281.5 and 114.8 for illiterates and literates, respectively, the former being in excess by 145 per cent. Negro illiterates also had a higher standardized rate than the literate, the rates being 771.8 and 230.4, respectively, the former being in excess by 235 per cent. Among foreign whites, however, the rates for illiterates and literates were 131.8 and 120.0, respectively, and the difference, 11.8 ± 6.9, cannot be considered statistically significant.

Some difficulties may be raised with respect to the significance of illiteracy among foreigners in New York State, since the immigration law specifies (with certain exceptions) that all aliens aged 16 years or over, physically capable of reading, who cannot read English or some other language, shall be excluded from the United States. The law went into effect in 1917, however, and 75 per cent of the first admissions to the New York civil State hospitals in 1929-1931 had been resident in the United States for 15 years or more prior to their admission to the hospitals, and consequently had not been subject to the provision of the law. In addition, appreciable numbers of illiterates had been admitted to the United States because they were under 16 years of age at the time of arrival.

Female first admissions to hospitals for mental disease in New York State showed results with respect to literacy similar to those of the male first admissions. There were 12,680 such first admissions during the three years ended June 30, 1931, of whom 11,686, or 92.2 per cent, were literate, and 994, or 7.8 per cent, were illiter-

ate. The corresponding average annual rates of first admissions were 77.4 and 148.2 per 100,000 general population aged 10 years and over. The rate of the illiterates was in excess by 91.5 per cent. When the rates are standardized, however, (the standard population being the same as that for the males) we obtain rates of 87.0 and 112.1 for the literates and the illiterates, respectively. The latter rate is in excess by 28.9 per cent. It is clear, therefore, that the illiterate population had higher rates of mental disease than the literate. As in the case of the male population, the degree of excess depends in part upon the nativity and race of the population. Thus, among natives of native parentage, the standardized rates for literates and illiterates were 67.5 and 201.5, respectively, the latter being in excess by 200 per cent. Among natives of foreign or mixed parentage, literates and illiterates had standardized rates of 90.6 and 279.5, respectively, the latter being in excess by 208 per cent. Among foreign-born whites, however, there was no difference in rates between literates and illiterates. Finally, among negroes the rate of illiterates was in excess by 120 per cent, a much smaller relative difference than that among native whites.

It should be noted that among the native white populations the illiterates had higher rates of first admissions than the literates. Among the foreign whites, on the contrary, there were no significant differences in rates of first admissions as between the literates and the illiterates. This somewhat anomalous result is undoubtedly due to selection. The great bulk of the foreign-born population came from countries where laws with respect to school attendance were lax and where educational facilities were limited. The consequence was that illiteracy, instead of being an index of intellectual retardation, was more nearly a measure of the social backwardness of the countries from which these immigrants came. It is not surprising, therefore, that among foreigners there is little or no difference in rates of first admissions among the literate and illiterate groups, since their illiteracy is not a measure of constitutional capacities. Among the native population of New York State, however, we expect that practically all of the intellectually normal will have been to school, since this is required by law. Mastery of the rudiments of reading and writing should therefore be a matter

of course among them. Illiteracy among natives is consequently likely to be associated with varying degrees of mental retardation. Such a population is known to possess higher rates of mental disease than the intellectually normal population. Hence, we must conclude, that high rates of first admissions among illiterates are not the consequence of illiteracy, or of lack of education. We should rather say that mental disease and illiteracy are both correlated with similar sets of factors.

Does this explanation also hold true for the negroes? We should note, in the first place, that almost 70 per cent of the negro population was not indigenous to the State of New York. They had migrated from other sections of the country, especially from the south, and from the West Indies, where rates of illiteracy are relatively high. By and large, we may feel reasonably certain that these illiterates were not the victims of a retarded mentality, but rather of social conditions over which they had no control. The literates, on the other hand, had the advantage of being largely indigenous to New York State. Now, it is known that a migratory population has higher rates of mental disease than an indigenous group.[2] We are therefore justified in concluding that the high rates of mental disease among the illiterate negroes are the result, not of their illiteracy, but of the deleterious social conditions to which any migrating population is exposed.

Having considered illiteracy in relation to mental diseases as a whole we may now study similar relations among patients belonging to the more prevalent groups of psychoses.

Psychoses with Cerebral Arteriosclerosis

There were 2,221 male first admissions with psychoses with cerebral arteriosclerosis during the three years ended June 30, 1931, of whom, 2,051, or 92.3 per cent, were literate, and 170, or 7.7 per cent, were illiterate. The rates of first admissions were 13.4 and 34.3 per 100,000 corresponding general population, aged 10 years and over. These "crude" rates were influenced by the fact that the illiterate population was older. However, this difference was not sufficient to account for the excess in the rate of first admissions among illiterates, since the latter had higher rates of first admissions at corresponding ages.

TABLE 3. FIRST ADMISSIONS WITH PSYCHOSES WITH CEREBRAL ARTERIOSCLEROSIS TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, DURING THE FISCAL YEARS 1929-1931, CLASSIFIED ACCORDING TO LITERACY

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	....	....	....	....	....	....	....	....
15-24	....	....	....	....	....	....	....	....
25-34	1	1	....	....	0.3	0.3	....	....
35-44	22	35	2	7	0.7	1.3	1.5	4.0
45-54	205	178	19	24	9.8	9.2	14.9	14.8
55-64	647	494	42	69	50.9	39.2	50.4	59.3
65 and over...	1,174	788	107	112	135.3	81.7	152.6	112.8
Unknown	2	....	....	....	....	....	....	....
Total	2,051	1,496	170	212	13.4	9.9	34.3	31.6

Among the native whites of native parentage, the illiterates showed a higher rate of first admissions than the literates, with due respect to age. This was also the case among native whites of foreign or mixed parentage. The difference was even greater among negroes. Among the foreign-born whites, on the other hand, the illiterates showed lower rates than the literates at 45 years and over.

In the case of the females, there were 1,708 first admissions with psychoses with cerebral arteriosclerosis, of whom 1,496, or 87.6 per cent, were literate, and 212, or 12.4 per cent, were illiterate. Corresponding average annual rates of first admisions per 100,000 general population aged 10 years and over were 9.9 and 31.6, respectively. The relative order was uninfluenced by age differences, since the illiterates had higher rates at corresponding ages. (See Table 3.) This was also true in relation to race and nativity, the illiterates among the native and foreign whites and among negroes having higher rates than the literate.

GENERAL PARESIS

There were 2,268 male first admissions with general paresis, aged 10 years and over, to all hospitals for mental disease in New York State during the three years ended June 30, 1931. Of this total, 2,133, or 94.0 per cent, were literate, and 135, or 6.0 per cent, were

illiterate. The corresponding average annual rates of first admissions were 14.0 and 27.2 per 100,000 population aged 10 years and over. The excess was due in part to age differences, however, for when the rates were standardized (the general population of New York State, aged 15 years and over on April 1, 1930 being taken as the standard) we obtained rates of 15.5 and 23.3 for the literates and the illiterates, respectively. Among whites and negroes we find similar results. Among the former, the illiterates had a crude rate of 23.7, compared with a rate of 13.0 for the literates. Among negroes the corresponding rates were 173.5 and 40.6, respectively. The comparisons were not affected by age differences, since the illiterates had higher rates of first admissions at comparable ages. Among the foreign-born whites the literates and illiterates had standardized rates of 15.9 and 18.1, respectively. The difference (2.2±2.5) is not significant, however, with respect to its probable error.

TABLE 4. FIRST ADMISSIONS WITH GENERAL PARESIS TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, DURING THE FISCAL YEARS 1929-1931, CLASSIFIED ACCORDING TO LITERACY

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	4	2	....	....	0.2	0.1	....	....
15-24	27	22	2	....	0.8	0.7	8.7	....
25-34	320	102	12	1	9.9	3.2	20.7	1.2
35-44	823	218	48	13	27.8	8.0	37.2	7.4
45-54	624	133	50	14	29.9	6.9	39.2	8.6
55-64	263	54	19	11	20.7	4.3	22.8	9.5
65 and over...	71	18	4	4	8.2	1.9	5.7	4.0
Unknown	1	....	....	....	....	....	....	....
Total	2,133	549	135	43	14.0	3.6	27.2	6.4

Among females there were 592 first admissions with general paresis, aged 10 years and over, of whom 549, or 92.7 per cent, were literate, and 43, or 7.3 per cent, were illiterate. The literate population had an average anual rate of 3.6 per 100,000 population, aged 10 years and over. The illiterate population had a corresponding rate of 6.4. These rates were influenced by age differences, how-

ever. The standardized rates (the standard population being the same as for the males) were 4.2 ± 0.2 and 4.4 ± 0.9 for the literates and illiterates, respectively. Considering the size of the probable errors, we may say that the rates were practically equivalent. Among the white population we find average annual standardized rates of 3.7 and 3.6 for the literate and illiterate populations, respectively. Similarly, among the foreign whites, the standardized rate of the literates, 3.8, was slightly in excess of that of the illiterates, 3.1. The differences are too slight, however, to be significant. Among female negroes the illiterates and literates had rates of 51.5 and 40.7, respectively, but the former has a probable error large enough to make the resulting difference statistically unreliable.

Alcoholic Psychoses

There were 1,424 male first admissions with alcoholic psychoses during the three years ended June 30, 1931, all aged 15 years or over, of whom 1,314, or 92.3 per cent, were literate, and 110, or 7.7 per cent, were illiterate. The corresponding average annual rates of first admissions were 8.6 and 22.2 per 100,000 population, respectively, the latter rate being in excess by 158 per cent. This is an exaggeration, however, due to age differences in the two populations. If we standardize the rates, using as standard the population of New York State, aged 25 years and over on April 1, 1930, we obtain rates of 12.4 and 19.9 for the literates and illiterates, respectively. The difference is statistically significant.

The same order of difference is seen when comparisons are made with respect to nativity and race. The highest rates were shown by illiterate negroes. Among the white groups, the illiterates and literates had standardized rates of 18.7 and 11.7, respectively.

There were 278 female first admissions with alcoholic psychoses, of whom 264, or 95.0 per cent, were literate, and 14, or 5.0 per cent, were illiterate. The average annual rates of first admissions were 1.8 and 2.1, respectively. The slight difference is spurious, however, due to age differences in the two populations. Taking the latter into consideration, it appears that the illiterates had a slightly lower rate of first admissions.

TABLE 5. FIRST ADMISSIONS WITH ALCOHOLIC PSYCHOSES TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, DURING THE FISCAL YEARS 1929-1931, CLASSIFIED ACCORDING TO LITERACY

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	....	....	....	....	....	....	....	....
15-24	22	8	2	....	0.7	2.4	8.7	....
25-34	216	39	4	1	6.7	1.2	6.9	1.2
35-44	426	99	33	9	14.4	3.6	25.5	5.1
45-54	380	78	40	2	18.2	4.0	31.4	1.2
55-64	212	37	22	2	16.7	2.9	26.4	1.7
65 and over...	58	3	9	....	6.7	0.3	12.8	....
Total	1,314	264	110	14	8.6	1.8	22.2	2.1

The rates varied with nativity and race, however. Negro illiterates had a higher rate than negro literates. But illiterate foreign white females had a lower rate than the corresponding literate group. There were no alcoholic psychoses among native-born illiterates of foreign or mixed parentage.

MANIC-DEPRESSIVE PSYCHOSES

There were 1,454 male first admissions with manic-depressive psychoses, all aged 10 years and over, during the 3 years ended June 30, 1931. Of this total, 1,416, or 97.4 per cent, were literate, and 38, or 2.6 per cent per, were illiterate. The rates of first admissions per 100,000 corresponding general population were 9.3 and 7.7 for literates and illiterates, respectively. The literate population was younger, on the average, than the illiterate population, and this influenced favorably their rate of first admissions. Standardizing both rates, using as standard the population of New York State aged 15 years and over on April 1, 1930, we obtain rates of 10.4 and 7.5 per 100,000 population for the literates and illiterates, respectively. The difference is less than its probable error, however.

Taking into consideration age differentials, illiterate native whites had higher rates of first admission than the literate native white population. Illiterate negroes also had a higher rate than

literate negroes. Foreign illiterate whites, however, had a lower rate than literate white foreigners.

TABLE 6. FIRST ADMISSIONS WITH MANIC-DEPRESSIVE PSYCHOSES TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, DURING THE FISCAL YEARS 1929-1931, CLASSIFIED ACCORDING TO LITERACY

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	1	4	....	....	0.1	0.3	....	....
15-24	307	472	1	....	9.6	14.1	4.3	....
25-34	300	639	5	15	9.3	19.7	8.6	14.0
35-44	344	523	15	45	11.6	19.2	11.6	25.7
45-54	279	312	14	28	13.4	16.1	11.0	17.2
55-64	145	143	2	5	11.4	11.3	2.4	4.3
65 and over...	40	31	1	3	4.6	3.2	1.4	3.0
Total	1,416	2,124	38	96	9.3	14.1	7.7	14.3

There were 2,220 female first admissions with manic-depressive psychoses, aged 10 years and over, during the 3 years ended June 30, 1931, of whom 2,124, or 95.7 per cent, were literate, and 96, or 4.3 per cent, were illiterate. The average annual rates of first admissions were 14.1 and 14.3 for the literates and illiterates, respectively. The relative order is spurious, however, resulting solely from age differentials. When the rates are standardized (using the same standard as for the males) we obtain rates of 15.8 and 12.0 for the literate and illiterate populations, respectively. The difference is on the border of statistical significance.

Because of small numbers of first admissions with manic-depressive psychoses among the illiterates, it is difficult to make adequate comparisons according to nativity and race. Nevertheless, it appears probable that among native whites of native parentage illiterates had a higher rate than literates, but that among native whites of foreign or mixed parentage illiterates had a lower rate than the literates. Among the foreign whites the literate and illiterate had practically equivalent rates. Negro illiterates probably had a higher rate than literate negroes.

Dementia Præcox

There were 4,286 male first admisions with dementia præcox aged 10 years and over, of whom 4,130, or 96.4 per cent, were literate and 156, or 3.6 per cent, were illiterate. The average annual rates of first admissions per 100,000 corresponding general population were 27.0 and 31.5, respectively. The relative discrepancy was increased on the basis of standardized rates, for then the literates and illiterates had rates of 29.8 and 37.8, respectively. The difference is probably statistically significant.

Among native whites and among negroes the illiterates had higher standardized rates than the literate. Among the foreign whites, on the contrary, the literates had a higher rate.

Table 7. First Admissions with Dementia Præcox to All Hospitals for Mental Disease in New York State During the Fiscal Years 1929-1931, Classified According to Literacy

Age (years)	Number				Average annual rate per 100,000 corresponding general population			
	Literate		Illiterate		Literate		Illiterate	
	Males	Females	Males	Females	Males	Females	Males	Females
10-14	21	13	....	....	1.3	0.8	....	....
15-24	1,263	619	9	2	39.3	18.4	39.1	7.3
25-34	1,466	1,060	29	25	45.4	32.7	50.0	29.0
35-44	907	955	67	86	30.6	35.0	51.9	49.1
45-54	360	515	42	57	17.3	26.6	33.0	35.1
55-64	85	167	8	17	6.7	13.3	9.6	14.6
65 and over...	22	37	....	3	2.5	3.8	....	3.0
Unknown	6	5	1	1	....	....	....	....
Total	4,130	3,371	156	191	27.0	22.3	31.5	28.5

There were 3,562 female first admissions with dementia præcox aged 10 years and over, of whom 3,371, or 94.6 per cent, were literate, and 191, or 5.4 per cent, were illiterate. The corresponding average annual rates of first admissions were 22.3 and 28.5 for literates and illiterates, respectively. This is spurious, however, for when the rates are standardized we obtain rates of 25.0 and 25.9 for literates and illiterates, respectively, indicating no difference between the two groups.

TABLE 8. STANDARDIZED RATES OF FIRST ADMISSIONS WITH DEMENTIA PRÆCOX TO ALL HOSPITALS FOR MENTAL DISEASE IN NEW YORK STATE, 1929-1931, PER 100,000 POPULATION AGED 15 YEARS AND OVER, CLASSIFIED ACCORDING TO SEX, RACE, NATIVITY AND LITERACY*

Race, nativity and parentage	Males				Females			
	Literate		Illiterate		Literate		Illiterate	
	Number	Rate per 100,000 population	Number	Rate per 100,000 population	Number	Rate per 100,000 population	Number	Rate per 100,000 population
Total population	4,130	29.8± 0.5	156	37.8± 3.2	3,371	25.0± 0.5	191	25.9± 2.3
White	3,833	28.8± 0.5	135	33.0± 3.1	3,076	23.8± 0.5	181	24.9± 2.3
Native of native parentage	898	19.5± 0.7	6	22.7± 3.1	703	15.6± 0.6	3	14.0± 8.6
Native of foreign or mixed parentage	1,404	30.0± 0.9	8	45.0±16.5	1,109	25.2± 0.8	6	33.4±14.3
Foreign	1,483	38.9± 1.1	120	34.1± 3.3	1,234	31.0± 1.0	172	25.1± 2.4
Negro	273	53.0± 3.8	16	131.3±38.5	293	54.4± 3.8	10	74.4±27.2

*The population used as standard was that of New York State, aged 15 years and over on April 1, 1930.

Considering rates according to nativity and race, we find no essential difference according to literacy among native whites of native parentage; among those of foreign or mixed parentage, the illiterate had a higher rate. Among foreign whites, however, the literates had a higher rate. Among negroes, the illiterate had a higher rate. These results are all subject to large probable errors.

Summary

In general, illiterates had higher rates of first admissions with mental disease than literates. This we have explained as due to a combination of constitutional and social factors. Native illiterates in New York State may be presumed to be intellectually retarded in varying degree. Among the foreign-born, on the other hand, illiteracy is more likely to be associated with social than with personal characteristics, and consequently there is much less variation among foreign literates and illiterates with respect to mental disease. Among negroes illiteracy is associated with problems of migration, and the social factors related to the latter are probably responsible for high rates of mental disease among the illiterates.

There are some important differences with respect to individual groups of psychoses. Among first admissions with cerebral arteriosclerosis, illiterates had higher rates than literates. This may result from an association of hypertension with the less desirable social situations that accompany illiteracy. With respect to general paresis, male illiterates had a higher rate of first admissions than literates. This probably indicates a higher rate of syphilis among the former. Since illiterates are, generally speaking, of a poorer economic status, it is probable that there is relatively more untreated syphilis among them. Among white females, on the other hand, there were no significant differences between literates and illiterates with respect to the prevalence of general paresis, indicating that females, in general, had relatively little syphilis as compared with males. There is a marked exception, however, with respect to female negroes, among whom illiterates had a higher rate of general paresis than literates. We find a similar picture with respect to the alcoholic psychoses. Male illiterates had higher rates of first admissions. This, again, is probably associated with poverty. In the case of the females there was less alcoholism

among illiterate females of foreign birth or foreign extraction than among the corresponding groups of literates. This is probably related to social attitudes among the foreign born which tend to discourage excessive drinking by females. Among female negroes, on the other hand, illiterates exceeded literates in the prevalence of alcoholic psychoses. This is probably related to the same set of social conditions that also produced more syphilis among them.

In the case of the manic-depressive psychoses we found a lower rate of first admissions among the illiterates. This resulted primarily from lower rates among the foreign white illiterates. Native white illiterates, on the other hand, had a higher rate than the literate. This bears out the inference that native illiterates are likely to be of constitutional inferiority, and we know that such factors are intimately related to the development of a manic-depressive disorder. In the case of dementia præcox, the results were not similarly clear-cut. Male illiterates, had generally higher rates than the literates. Among females, however, there were, on the whole, no significant differences in the rates in relation to literacy. Among both sexes, the foreign illiterates had lower rates of dementia præcox than the foreign literates.

Illiteracy, we may conclude, is not related causally to the prevalence of mental disease. Illiteracy may be related either to intellectual retardation, or to social conditions which lower standards of education. In either case, illiteracy is a consequence and not a cause, and we may say that the conditions which were responsible for illiteracy were also responsible, in large degree, for the prevalence of mental disorders.

New York State
Department of Mental Hygiene
Albany, N. Y.

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A COMPARATIVE STUDY OF PSYCHOSES AMONG NEGROES AND WHITES IN THE NEW YORK STATE PRISONS

BY SAMUEL C. KARLAN, M. D.

A number of studies of the comparative frequency of the various psychoses among negroes and whites have already been made. Malzberg[1] found in New York State that the annual incidence of all psychoses for negroes was 150.8 per 100,000 and 75.1 for whites. The incidence of schizophrenia was 45.4 for negroes and 22.4 for whites and psychoses due to syphilis, 28.9 and 8.2. In commenting on general paresis, Malzberg stated that the relatively higher rates of that disease among negroes could be ascribed in large part to deleterious social surroundings. With respect to schizophrenia and manic-depressive psychosis, he stated, "There is probably a less stable, more emotional makeup among negroes than among whites. Given such emotional instability, it is likely that there is fruitful ground for functional mental disorders." Wagner[2] made a similar comparative study among first admissions in Cincinnati. He found that the annual incidence of all psychoses was 189.2 for negroes and 95.1 for whites; of schizophrenia, 26.3 for negroes and 16.2 for whites; and psychoses due to syphilis, 22.8 for negroes and 13.8 for whites. He concluded that the preponderance of psychoses among negroes was probably of environmental origin, namely, economic, cultural and educational influences. Malzberg[3] made another study in which he compared the relative frequency of psychoses of whites and negroes born in New York State, and those born in other states. He found that the annual incidence of all psychoses of negroes born in New York State was 40.0 and that of whites, 44.6; schizophrenia, negroes, 12.3 and whites, 12.5; and general paresis, negroes, 4.3 and whites, 3.8. For those born in other states, the annual incidence of all psychoses of negroes was 185.5 and of whites, 156.9; schizophrenia, negroes, 51.5 and whites, 40.5; and general paresis, negroes, 36.3 and whites, 15.3. He concluded, "It is likely, therefore, that the excess formerly attributed to race is due to environmental influences such as those associated with migration." He also stated, "Much of the excess of the negro rate of New York State must therefore be ascribed not so much to

racial characteristics as to the economic and other social difficulties to which a migratory population is subject."

It is obvious from the above that it is difficult to make a clear comparison of the relative frequency of psychoses among negroes and whites because it is recognized that they do not live in a similar cultural and economic environment. It therefore occurred to the writer that it would be valuable to make such a study in a situation where the negroes and whites are in a practically equivalent milieu. Such a condition does exist in the New York State prisons. Negroes and whites are treated equally here. The social and cultural state of both groups is naturally low but nearly the same. The economic state is equivalent, as all are handled similarly by the authorities.

The writer therefore investigated all the first admissions to the Dannemora State Hospital from the New York State prisons from June 30, 1928 to June 30, 1938. These included 687 whites, of whom 227 were foreign born and 460 were native born, and 188 negroes, of whom 21 were born in New York State and 167 were born in other states or in the West Indies. During these 10 years, there were 25,538 white and 5,494 negro commitments to the institutions of the New York State Department of Correction. Table 1 gives the incidence of mental disease per 1,000 commitments. The incidence of the prison psychoses among whites was 12.3 and among negroes, 11.7. The incidence of dementia præcox was 10.7 in whites and 14.6 in negroes. In general paresis, the respective rates were 1.05 and 4.8. The corresponding figures for all psychoses were 26.9 and 34.4. It is to be noted here that the incidence of the psychoses due to the prison environment was practically equal in both races. In the case of dementia præcox, it was somewhat higher in negroes. General paresis is regularly more frequent among the colored, but since the syphilis was contracted before the commitment to prison, it is of little relation to the comparative incidence of psychoses in the correctional institutions.

Complete figures as to the average negro and white population of the New York State prisons were not available. The only figures that the prisons had were those of June 30 of each fiscal year and some of the institutions had them only for the last two or three years. The writer made an attempt to estimate the white and

TABLE 1

	Number of cases		Incidence per 1,000 commitments	
	White	Negro	White	Negro
Psychosis with psychopathic personality	279	55	10.9	10.1
Psychosis with mental defect	35	9	1.4	1.6
"Prison psychoses" (the above two added together)	314	64	12.3	11.7
Schizophrenia	259	80	10.2	14.6
Manic-depressive psychosis	35	8	1.4	1.46
Psychoses due to syphilis	27	25	1.05	4.8
Other psychoses	52	11	2.0	2.0
All psychoses	687	188	26.9	34.4

TABLE 2

	Number of cases		Incidence per 10,000 annual prison population	
	White	Negro	White	Negro
Prison psychoses	153	34	38.3	31.4
Schizophrenia	145	34	36.3	31.4
Manic-depressive psychosis	24	6	6.0	5.5
Psychoses due to syphilis	13	20	3.3	18.5
Other psychoses	38	7	9.5	6.5
All psychoses	373	101	93.3	93.3

negro populations of some of the prisons by averaging the figures at the beginning and the end of the fiscal year. In this manner, the writer had data for an average annual population of 3,995.4 whites and 1,088.2 negroes. During the 10 years described above, this group had 373 white and 101 negro psychotics. Table 2 gives the annual incidence per 10,000 inmates. The incidence for all psychoses was equal, namely 93.3. The incidence of the prison psychoses was 38.3 for whites and 31.4 for negroes; dementia præcox, 36.3 and 31.4; and psychoses due to syphilis, 3.3 and 18.5. Except for general paresis, there was a slightly lower psychotic rate among negroes than among whites, thus entirely refuting the supposition that racially negroes were more prone to psychoses and were more unstable than whites. Considering both tables, we may

conclude that the high incidence of mental disease among negroes is due to cultural, social, environmental and economic causes rather than to any supposed racial predisposition.

I have also made a comparison of the relative frequency of psychoses among prison inmates and the general population. Table 3 gives the frequency per 100,000 of psychoses of different types in white criminals and the general white population. The highest incidence of psychoses occurred among the migrant whites, namely, whites born in other states. However, that was from 10 to 16 per cent of the incidence of psychoses among white prison inmates, except in the case of general paresis. Migrant (born in other states) negroes also had the highest psychotic incidence, but even that was only about one-fifth as high as the rate of mental disease among colored prison inmates. These figures therefore indicate that insanity is from five to ten times as frequent in prison as it is outside of the penal institutions. There are several contributing factors to this result. In the first place, the age of prison inmates is 17 years or over and averages around 30 years, which is considerably higher than the average of the general population. Since psychoses occur more frequently in an older group, it is to be expected that the psychotic rate in prison should be higher than usual. Second, while many psychotics are not committed when free, their abnormalities are immediately noticed when incarcerated, and they are transferred to the State hospital without delay. Yet, I feel that these reasons do not explain entirely a psychotic rate that is five to ten times as high as the average. It must be assumed that the prison population is probably much more constitutionally unstable than the general population and that this is the reason for the exceedingly high incidence of psychoses among inmates of correctional institutions.

TABLE 3a

	Incidence per 100,000 whites				
	White prison inmates	Cincinnati residents[2]	N. Y. City residents[1]	N. Y. State foreign born males[4]	N. Y. State males born in other states[3]
Schizophrenia	363	16.2	22.4	31.4	40.5
Psychoses due to syphilis...	33	16.6	8.2	10.7	15.3
All psychoses	933	95.1	75.1	125.5	156.9

TABLE 3b

	Incidence per 100,000 negroes			
	Negro prison inmates	Cincinnati residents[2]	N. Y. City residents[1]	N. Y. State negroes born in other states[3]
Schizophrenia	314	26.3	45.4	51.5
Psychoses due to syphilis	185	40.3	28.9	36.3
All psychoses	933	189	150.8	185.5

SUMMARY

1. The incidence of psychoses in the general population is higher in negroes than in whites.

2. In the New York State prisons, negroes and whites are in a similar cultural and economic environment.

3. The incidence of functional psychoses among negro inmates is about the same as that among white prisoners.

4. Negroes have therefore no racial predisposition to mental disease. High incidence of mental disease among them is probably due to cultural, social and economic causes.

5. The incidence of psychoses among prison inmates is five to ten times as high as that of the general population. This is mostly due to the inherent constitutional instability of the criminal group.

Dannemora State Hospital
Dannemora, N. Y.

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ARE MENTAL DISEASES ON THE INCREASE?

*The Problem of Determination**

BY HENRY B. ELKIND, M. D.

This article will not attempt to answer the question whether the various mental diseases are on the increase.** The author has attempted this in earlier communications[1, 2] and others participating in this symposium are directly attacking this problem. This paper will rather point out the difficulties of determination which face the investigator.

To answer this important question the following conditions should be met:

1. Annual statistics of first admissions to hospitals for mental disease should be available and in addition annual censuses of cases in the community not hospitalized.

2. These statistics should be divided according to a universally employed nosological scheme, such as the classifications approved by the American Psychiatric Association. Further, this scheme should have been in effect for a relatively long period of time.

3. There should be fair assurance that the diagnoses are reasonably reliable and stable. This assurance should hold both for time and place; that is, there should be little variation in diagnoses between hospitals and others responsible for diagnosis, both at the time the investigation is being made and over the previous years.

4. These statistics should cover a long enough period of years to give time-trends adequate for statistical treatment and induction.

This is truly an ideal situation and is approached in but few instances in physical disease, to say nothing of mental illness. Some success has been achieved in the field of communicable disease. A good example of fairly inclusive morbidity statistics of chronic diseases for a given year is to be seen in the chronic disease survey made under the auspices of the Massachusetts Department of Public Health some years ago. Although the survey gave too little attention to mental cases, this was not entirely from choice but

*Paper read as part of a symposium "Are Mental Diseases on the Increase?" at the annual meeting of the American Psychopathological Association held in Atlantic City, May 4, 1938.

**It is assumed that the question is asked from the medical and biological point of view, and not from the administrative.

largely because of the difficulty of determination of diagnosis of cases at home by the investigator.

Statistics of mental disease satisfying all the above conditions are not available. To what extent do they approximate these conditions? If the approximation is fairly good, then it may be possible to make a good guess as to the likely answer to the question under discussion; or it may be possible to secure answers for a few of the disorders, if not for all.

The simplest and most direct approach to the matter, in the opinion of the writer, would be to analyze the statistics of Massachusetts and New York and test their adequacy, although this unfortunately limits the field of inquiry. These two states are considered to have the best statistics in the field of mental disease in the United States, if not in the world. They have highly-centralized state departments having close supervision over all hospitals and institutions, both public and private, caring for the mentally ill in their states. These departments have strong divisions within their organizations specially devoted to the standardization, collection, tabulation, classification, and study of statistics, and have published excellent reports. Their interest in statistics is not only administrative but medical and scientific.

It is obvious that first admissions (not resident population nor readmissions) are the only hospital statistics which should be used for statistics of incidence over a period of years. Massachusetts provides these from 1881 on (or from 1904 on if one wishes to limit the statistics to the period of complete State control) and New York, since 1909. But these time-trends are only for total admissions. If one wishes first admissions for particular disorders, one can secure these in a continuous series only from 1920 for Massachusetts and from 1917 for New York.

But do these statistics include the cases in the community who do not require hospital care or who, even if they do, remain in the community without such care? It is the opinion of the writer that there are large numbers of the mentally ill who in any given year are not found in the annual statistics of first admissions.

The statistical reports for New York give no hint of the magnitude or the significance of the thousands (estimated, at least, at three to four thousand) of cases who are cared for in general hos-

pitals, such as Bellevue Hospital in New York City, which provides a complete psychiatric service for the care of mental patients.* The writer has been informed that from one-fourth to one-third of these cases eventually find their way into State hospitals. They are, of course, included in the official statistics of first admissions. But as to the balance of them who are not committed, how many of these are mentally ill? This is a problem which will be discussed later in this paper.

In Massachusetts, the state hospitals (and licensed institutions), however, care for the bulk of the type of cases which in New York tend to be treated in general hospitals. Therefore they do appear in the official hospital statistics, although tabulated separately from first court admissions, which have been widely utilized as the best index of incidence of mental disease in the general population. These are available from 1910, but only from 1930 by diagnosis. The following table from the 1936 report of the commissioner of mental diseases of Massachusetts gives a good picture of what proportion of all cases admitted to state hospitals for the first time are eventually committed by court procedure, namely about 60 per cent. The question remains: Of the 40 per cent who are admitted for "temporary care," "observation," or under voluntary papers, and who are not eventually committed, what proportion are "mentally ill"?

PERCENTAGE DISTRIBUTION IN LEGAL STATUS OF ALL CASES ADMITTED FOR THE FIRST TIME AND OF ALL READMISSIONS, 1936†

	All cases admitted for first time	All readmitted cases
Court commitment	27.6	20.3
Temporary care	25.8	27.8
Observation	7.1	10.5
Voluntary	3.1	5.7
Temporary care and observation	2.6	3.2
Temporary care and voluntary	1.1	2.1
Temporary care and court commitment	18.2	20.5
Temporary care, observation and court commitment	3.3	2.5
Observation and court commitment	9.9	5.8
Others and court commitment	.4	.9
Other combinations	.9	7
	100.0	100.0

*Recent statistical reports of New York give figures for the Syracuse State Psychopathic Hospital but these are kept segregated and are not related to the official reporting system.

†From annual report of the commissioner of mental diseases, Commonwealth of Massachusetts, for the year ending November 30, 1936.

The writer is of the opinion that persons are diagnosed "psychotic" and admitted by regular court commitment for the most part only if the hospital authorities or committing officials believe them "insane." In other words, a person suffering from some form of mental disorder will be denied regular court commitment if he proves to be "mentally competent" under the law. How often does one hear, "The patient is mentally ill but not committable." Committability, in terms of statute procedure, then, is the usual discriminating criterion, not the absence, presence, or severity of mental disorder. This practice is found in both New York and Massachusetts.

It is difficult to estimate the number of mentally ill persons who remain in the community and who do not enter hospitals. But the number must be fairly large, relatively speaking, if one includes the "chronic" alcoholics, the epileptics, mild cases of manic-depressive psychosis and of schizophrenia, the majority of psychoneurotics, paranoid personalities, mild psychotics of advanced age, and the like. Massachusetts has at least fifty psychiatrists in private practice. Assuming that each treats on the average 25 persons with mental sickness during the year who do not go to hospitals, then there are at least 1,250 persons with mental sickness receiving treatment whose cases do not get into the official figures, an error of about 35 per cent (if first admissions by court commitment for 1936 are used as the base.) In the writer's opinion the actual number is larger than this.

In this connection we must take into consideration those persons treated by family physicians, most of whom are unrecognized and undiagnosed as mentally ill.

The next difficulty in the determination of the answer to the question under discussion is the reliability of diagnosis. The first official classification of mental diseases in this country used by all state hospitals came into use in 1916 and since then comparable statistics for mental disease have been at least theoretically available. This step represents a great advance, any criticism of reliability to the contrary.

However, one has to settle the question of the degree of variation in diagnosis when one is interested not in the incidence of mental diseases as a whole but in terms of individual disease entities. This

is an important problem in the epidemiology of physical disorders and ought to be considered in that of mental illness.

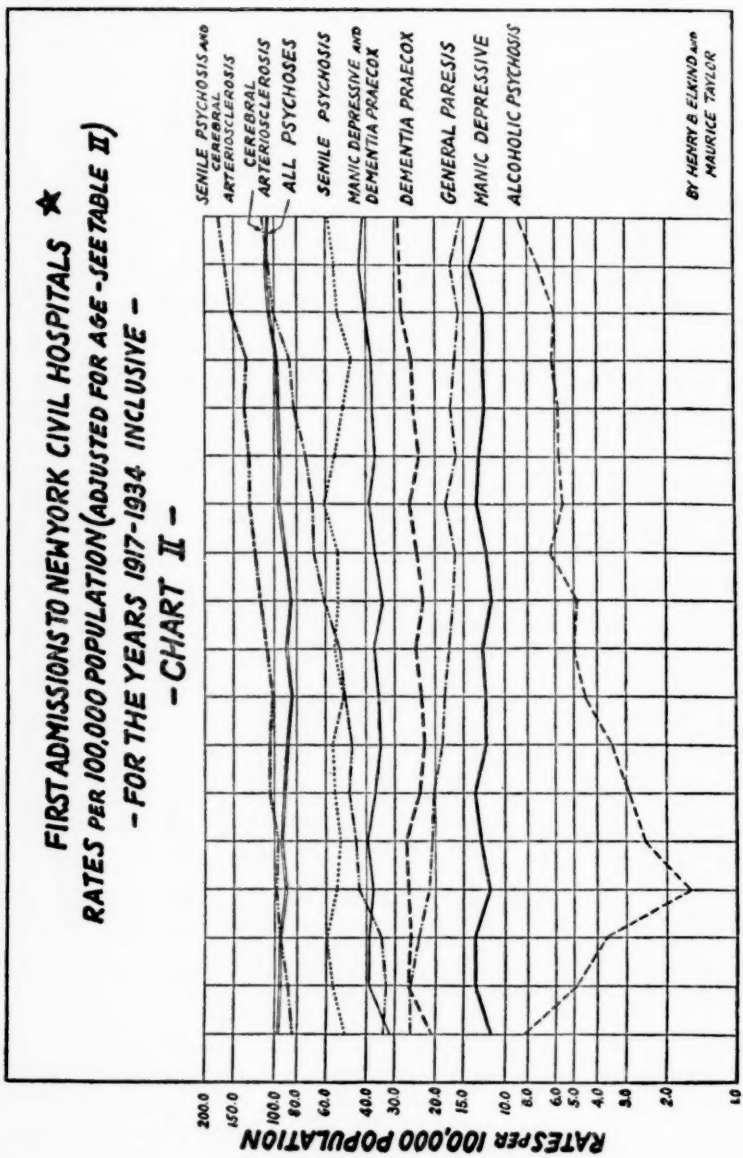
Variation has to be considered both from the point of view of those making diagnoses, as between hospitals, and with respect to time. It is difficult to settle the matter but this was seriously inquired into in connection with a statistical research of schizophrenia conducted at the Boston Psychopathic Hospital from 1925 to 1934. From reading the papers of the volume which are pertinent[3, 4, 5] it might be concluded that:

1. It is fairly likely that diagnosis differs much between hospitals and probably more so than the variation of diagnosis in individual hospitals over relatively short periods of time. This conclusion should be corroborated. Such variation includes the more important diagnoses, such as schizophrenia, manic-depressive psychosis, general paresis, senile psychoses and those with arteriosclerosis.

2. In one hospital, at any rate, agreement in diagnosis between it and other hospitals ranges from 100 per cent to 0 per cent for the various diagnoses, with a median of 60 per cent. A parallel situation probably exists in the field of internal medicine. With this serious question of variation in diagnosis in mind, Taylor and Elkind in their paper on "The Alleged Increase of the Major Psychoses" combined certain classifications in order to minimize the effect of variation in diagnosis. This method seems more reliable than considering diagnoses individually, as is the usual procedure.

The determination of the fact of increase, or decrease for that matter, depends fundamentally upon the analysis and study of time-trends. If time-trends are too short in length, any inference from them is apt to be erroneous, particularly when one attempts to correlate them with others. If too long, according to Ellen Winston,[6] they are apt to exhibit too much the influence of administrative, legal, and local factors.

Analysis of the time-trends for general paresis is worthy of consideration here as such analysis will suggest further statistical difficulties. General paresis has been selected as it is one important mental disease for which the diagnosis, in recent years at least, is highly reliable. The time-trends for both Massachusetts and New York show a definite and fairly steady rate of decrease. Is there



*"The Alleged Increase in the Incidence of the Major Psychoses," by Elkind and Taylor, Chart II, p. 824. Ibid.

any evidence that the rate has been falling more rapidly in recent years than in previous decades? Twentieth century developments in the treatment of this disease would lead one to assume that whatever drop in the rates has occurred recently might be attributed to medical improvements. However, analysis suggests that this conclusion is probably premature.

The time-trend for New York, which is here illustrated, is for 18 years. It could be extended two or three years more at the present time. Despite the popular opinions on this question, there seems not to be sufficient evidence for crediting new medical advances with reducing the rate. Somewhere in the period from 1905 to 1915 the etiological cause of syphilis became known, the Wassermann test was made available to assist in its clinical diagnosis, and Ehrlich's 606 began to be used in its treatment. Let us assume that about 1915 a good many of the cases of syphilis then in the community were correctly diagnosed, that all of them took treatment, and that many of those destined (for reasons at present unknown) to develop general paresis were cured of syphilis, or sufficiently so to prevent cerebral involvement. The influence of all these factors, therefore, would begin to take place not before 10 years later at least, that is, about 1925 or probably later, since general paresis is a sequel to syphilitic infection that usually follows after an interval of years. Actually, however, one sees a decrease taking place earlier in the statistics of New York and Massachusetts.

These are the more important difficulties which face the statistician in search of an answer to the question of whether mental disease is on the increase. Despite these difficulties, however, tentative estimates based on the data available offer at least suggestive hypotheses concerning the course of mental disease. Like all hypotheses they are subject to verification and are to be retained only so long as they do not conflict with known facts. The writer wishes to offer his opinion that the statistical data available do not on the whole justify the oft-repeated statement that mental diseases are on the increase. There is some possibility, however, that those accompanying old age do show a slight increase in incidence. Until adequate and ample data are produced, the hypothesis that mental

diseases in general are not on the increase seems to the writer the most plausible.

Massachusetts Society for Mental Hygiene
3 Joy Street
Boston, Mass.

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ARE MENTAL DISEASES ON THE INCREASE?

Excerpts from the round table discussion at the twenty-eight annual meeting of the American Psychopathological Association, held at Atlantic City, N. Y., May 4, 1938.

Introduction

BY JOSEPH ZUBIN, PH.D.
UNITED STATES PUBLIC HEALTH SERVICE, MENTAL HOSPITAL SURVEY COMMITTEE

The continued advances of medical science in the field of acute infectious diseases have brought into prominence a new frontier, that of chronic illness, and in this area the mental diseases occupy a foremost place. It has been estimated that about 1 per cent of the general population, or nearly 1,300,000 individuals, are incapacitated because of some form of mental illness or handicap at any one given time. The amount spent for the care of the half-million hospitalized patients alone is well over $166,000,000 annually. The latter occupy approximately 47 per cent of all hospital beds in the United States. About 97 per cent of these patients are cared for in state hospitals and institutions, and the maintenance expenditures for these patients account for 7 per cent of all state budgets.

In view of the importance of this problem a discussion was held at the annual meeting of the American Psychopathological Association. Dr. Abraham Myerson served as moderator and the following workers in this field participated: Dr. Harold F. Dorn, United States Public Health Service; Dr. Benjamin Malzberg, New York State Department of Mental Hygiene; Dr. Henry B. Elkind, Massachusetts Society for Mental Hygiene; Dr. Carney Landis, Columbia University and New York State Psychiatric Institute and Hospital, and Dr. James D. Page, department of psychology, University of Rochester. Their papers were discussed by Dr. Ellen Winston, Works Progress Administration; Dr. Emil Frankel, New Jersey State Department of Institutions and Agencies; Dr. Joseph E. Raycroft, New Jersey State Department of Institutions and Agencies; Mr. Joe S. Jacob, University of Georgia; Dr. N. D. M. Hirsch, Social Security Board, and the writer. The discussion was summarized by the moderator.

Before presenting the papers themselves it is necessary to define certain general terms and statistical concepts that occur frequently. The question of whether mental diseases are on the increase may be treated from several points of view.

The administrator of institutions for the care of patients is interested in this problem from the point of view of predicting the future needs of his hospitals . . .

The legislator and the average layman whom the administrator calls upon for tax funds would like to know how much money would be needed for caring for all these patients . . .

The epidemiologist, on the other hand, would not be so interested in the increase in costs nor in the total increase in all types of mental disease, as he would be in the increases by specific categories of diagnosis. . . .

The sociologist, while interested in the general trend of mental diseases, would be interested more specifically in the trends in the various social groupings of the population—urban and rural, socio-economic levels, and the ecology of mental disease . . .

The statistician of mental disease is of course interested in all of these questions, since he must prepare his statistics in such manner as to throw light on these problems.

Some of these questions cannot be answered fully or adequately by the data now on hand because these data are based primarily on hospital reports and not on a complete census of the general population. The total number of the mentally ill can only be guessed at. Even the data that we have on hand are not uniform from state to state. Most of the patients included in these reports are diagnosed as with psychosis but even in progressive states like Massachusetts, New York and Illinois a goodly number of patients diagnosed as without psychosis are included . . .

* * *

The prevalence of a disease is determined by correlating the number of patients suffering from the disease at any one time with the general population. This prevalence is usually expressed as a rate per 100,000 of the general population. The prevalence of hospitalized mental disease is expressed similarly as the number of patients in the mental hospitals per 100,000 of the general population. But mental disease is largely chronic and the average length

of stay of mental patients in the hospital is about five years, with a range varying from less than one year to more than 20 years in individual cases.

The accumulation of older patients from year to year tends to give a false impression of the prevalence of mental disease. Even if mental disease were declining, the total number of patients would not show a decline because of the accumulated old ones. In order to obviate this source of misinterpretation, the new admission rate based on the number of patients admitted for the first time in the course of one year is used as a gauge of the current trend in mental disease. Only the new admission or first admission rates will be used in these discussions. These too are expressed as rates per 100,000 of the general population.

It is, however, a well-known fact that the general population is changing in many respects and some of these changes must be affecting the course of mental disease. Before comparing the first admission rates in two different years we must distinguish between the changes in mental disease *per se* and the changes due to extraneous factors. Thus, the age distribution which is highly related to mental disease is changing rapidly . . . Most of these changes would tend to increase the apparent rate of first admissions even though the true rate were at a standstill . . .

The vast majority of mental patients are hospitalized for the first time after they have attained puberty. In most of the states, only rarely do children enter a mental hospital, and only recently have special children's wards been opened in the more progressive states. In order to compare the first admission rate of 1930 with that of 1920, the age distribution of the population in these two years must be considered. The population as a whole is growing older on the average, that is, the older age groups constituted a larger proportion of the population in 1930 than they did in 1920. This fact alone would tend to increase the first admission rate, for there are proportionately more people exposed to hospitalization in the age groups where the risk of hospitalization is high. There are three methods available for removing this source of difficulty in comparing rates—"age-specific" rates, standardized rates, and expectancy rates . . .

. . . the specific age rate method is utilized by Dr. Landis and Dr. Page; the standardized rate method is utilized by Dr. Malzberg, while the expectancy rate method is utilized by Dr. Dorn. The latter introduces an interesting variation of the expectancy rate technique. Since the number of people alive and "sane" in any given year depend not only on those who become mentally ill before that age, but also on the number who died before attaining the given age, he evolves a technique for holding the mortality rates constant also. In comparing 1920 and 1930 it is obvious that the mortality rates have changed in this decade. In order to obviate differences in incidence that may be due to the greater proportion of people alive at the various age levels, the mortality rates for 1920 are utilized in computing expectancy rates for both 1920 and 1930. The expectancy for 1930 is thus the number of people who would have been hospitalized if the population in 1930 had had the same mortality rates as in 1920. It would be interesting to carry out a similar technique for isolating such factors as urbanization, socioeconomic status and racial composition. When all of these factors are held constant, the difference between the first admission rates in the two years would be better evidence of whether mental disease *per se* is on the increase or not.

The general results of the round table discussion may be summarized as follows: Dr. Dorn and Drs. Landis and Page concur in the conclusion that most of the increase in hospitalization for mental disease arises from increased longevity in the population which permits a larger proportion of the population to live to the age when mental diseases most frequently develop.

Dr. Malzberg finds on the contrary that there has been a definite increase not only in the psychoses of old age but also in dementia præcox and in all mental diseases taken as a group. Dr. Elkind questions the accuracy of conclusions based on present-day data but is in general in agreement with the thesis that mental diseases are not on the increase.

Dr. Myerson closes the discussion with an analysis of the contributions and their significance from the point of view of practical application to psychiatric procedures. Dividing the psychoses into three major divisions—exogenous, constitutional, and diseases of the senium—in his opinion there is general agreement that in the

group of exogenous psychoses, the psychoses associated with syphilis are declining, while those associated with alcohol have shown a slight upward trend since the introduction of prohibition and its repeal; that the constitutional disorders (dementia præcox, manic-depressive psychosis, involutional psychosis, etc.) are almost stationary in trend and that only the diseases of the senium (psychosis with arteriosclerosis and senile dementia) are on the increase.

Analysis of the Contributions

BY ABRAHAM MYERSON, M. D.

The papers presented this evening appear to diverge from one another in conclusions, and one is left with some degree of pessimism concerning the availability of facts which have real statistical validity. But this divergence and this difficulty are only superficial and, as a matter of fact, when one makes the correction, as the statisticians say, for an error which has appeared throughout the discussions, the results seem clear and plain as a pike staff, and a program of work of practical value emerges from what at first sight resembles something like chaos.

The underlying defect is due to the malign influence, still operating, of the word and concept "insanity." Substituting "mental disease" for "insanity" does no good if one is then led to discuss all the psychoses as if they were one and had the same general biological and social significance. This is as if a statistician were to attempt to evaluate the prevalence of tuberculosis and to consider with it colds in the head, coughs of all sorts, and included pneumonia as well. It is obvious that no understanding of tuberculosis would result; that the variables and factors would be too confused and confusing for an accurate evaluation.

When one studies those psychoses which come within the field of the state hospitals and which form the major known part of the expenditures of each state in respect to mental disease and which can thus be studied objectively and scientifically, one finds that there are three separate and etiologically fundamental groups. The other psychoses all lumped together would probably not constitute 10 per cent of the total hospital population of the institutions.

I. *Exogenous Group:*

This first group may be divided into two parts and be given the general title of the exogenous diseases and poisons. Of first importance is syphilis. All the statistics presented here tonight are in agreement as to the relative role of this infection. There is no increase in the number of cases admitted to the hospitals for mental disease which are due to syphilis; in fact, there is agreement that there is a decline. In other words, the statistics readily show that a group of factors is operating to reduce the cases of general paresis in the institutions. This group of factors is due to the advance of medicine so that (1) a precise and early diagnosis of syphilis is possible, (2) earlier and more intensive treatment is being instituted. Whether the treatment be the early use of arsphenamine or the use of arsenical substances or whether the introduction of fever therapy is responsible need not concern us here. All these methods of treatment plus early recognition has brought about a decrease in this disease. We can then point out to society that the avenues for the elimination of those mental diseases due to syphilis are simple enough to follow . . .

The second exogenous factor is alcohol. All the statistics have one and the same message to give us. First, the alcoholic mental diseases were declining steadily before the passage of the Prohibition Amendment, through the pressure of education and of industry. Nothing in the whole field of statistics is quite so clear as this fact. Then came the Prohibition Enactment, and we saw for a very short time so sharp a reduction of the psychoses due to alcohol that they almost disappeared, and then there took place an elevation of the level of incidence until it reached a place about equal to what it was somewhat before the Prohibition Enactment went into "effect."

The lesson is clear. The campaign which is to be introduced for the reduction of the alcoholic psychoses is correspondently definite. The lesson is that education is the most important factor in dealing with the use of a substance which has its roots in the traditions and immemorial customs of mankind, which has the remarkable property of changing personality and so softening the struggles and frustrations of existence through narcosis or artificial euphoria. This campaign of education must go on again . . .

II. *Constitutional Hereditary Diseases:*

The main diseases which depend in large measure, at any rate, upon constitution and heredity, are dementia præcox and manic-depressive psychosis. The statistics concerning the incidence of these diseases suffer from the great defect that there is no clear-cut differentiation between them, at last in many cases. Or to put it otherwise, the diagnostic criteria vary from hospital to hospital with the result that statistics are quite confusing and we can gain no adequate idea of the increase or decrease of these diseases because of the present-day failure of psychiatry to establish definite and complete diagnostic criteria. Nevertheless, if the two groups of diseases are lumped together, the number so reached will include most of the cases that relate directly to inheritance or constitution of inheritable type. A small group of paranoid psychoses will be left out of consideration. Involutional cases which are vaguely related might be included in the group as belonging to the same type of disorder. The statistical difficulties would largely disappear, so far as a practical program of prevention is concerned, although of course it will still be necessary for psychiatry to establish criteria of objective type for the differential diagnosis of these conditions. At the present time, if a statistical study includes both these diseases, no great or definite increase in their incidence is shown, even if we accept the figures of Malzberg, who is of the opinion that mental diseases are on the increase. However, that increase is not in any direct manner manifest in the manic-depressive and dementia præcox groups. The statistics of other states, for example, Massachusetts (reported by Elkind and Taylor) show, if anything, a slight decrease . . .

Consequently, the prevention of these diseases is at present a problem of eugenics and, therefore, of appropriate sterilization. We do not thereby state that the case for heredity has been entirely established, in that there are no other factors operating; in fact, it is my belief that there are unknown environmental factors which play a role in the production of these diseases. But whatever that role is, the role of constitution is not disputed in the major literature of the world and in the minds of most psychiatrists. This concept need not prevent us from undertaking therapeutic meas-

ures. The paradigm of diabetes at once occurs to us. This disease is probably constitutional in origin, but this belief or fact has not prevented medicine from introducing insulin and other therapeutic agents . . .

III. *Diseases of the Senium:*

The third group of importance is the one largely responsible for whatever appearance of increase in mental disease is shown in the statistical studies presented to us tonight. That is the group of diseases occurring in old age or towards the senium. Here a practical point must be emphasized. There are fashions in diagnosis, and it appears to be the fashion at present to say cerebral arteriosclerosis rather than senile dementia, but I venture to say that the differentiation during life is very imperfectly made, and any pathologist will confirm this statement. So far as the statistician is concerned, it would be wiser to combine the two diseases so far as the present is concerned and thus solidify the situation for statistics. Substantially the same general background of etiology is present. Whether this last statement be entirely true or not is a matter for future research. For the present it will be categorically stated that as the population has grown older, as the hospitals have grown more accessible and acceptable to the public, and as the conditions of modern life have made it more difficult to take care of old people at home (or perhaps have made their children more unwilling to do so), the role of these diseases in bringing about commitment to a state institution has become the most important factor. In point of numbers, the people admitted towards the latter part of life outweigh those admitted from early maturity to old age.

We are not likely to solve the problem of the prevention of these diseases for a long time, and no matter how far off we put the senium, by whatever new therapeutic agents we bring into use, it is obvious that old age will come sooner or later and that in many instances it will be associated with a mental breakdown . . . There does not seem to me to be any reason beyond the traditional one for classifying senile dementia and cerebral arteriosclerotic dementia with schizophrenia, manic-depressive psychoses, and so forth . . .

From a medical standpoint, they should be classified separately from the other psychoses. Whatever building programs are undertaken in the future should take into account primarily the fact that has been brought out by all the papers of the evening. That is, that future increase in the hospital population will be largely due to the increasing age of the general population and the consequent brain disease of an increasing number of persons . . .

ADDENDUM

A. A. Leonidoff, author of "Control of Tuberculosis in the Hudson River State Hospital," an article appearing in the October, 1938, number of this journal, has asked us to reprint, for greater clarification, a table which was on page 761 of the above issue. The author has added some details not included in the original manuscript.

X-ray, fluoroscopy, and physical examination:

Negative group	169 patients—	Negative by X-ray Negative by fluoroscope Negative by physical examination
Probable Negative	8 patients—	Suspected by X-ray—calcified tubercles Negative by fluoroscope Negative by physical examination
Positive group	5 patients—	Positive by X-ray—parenchymatous infiltration Negative by fluoroscope Positive by physical examination—presence of moisture
Probable Positive (potential group)	12 patients—	Positive by X-ray—fibrotic changes, calcified nodes, questionable shadows Positive by fluoroscope Positive by physical examination—changes of breath sounds; no moisture
Positive group	2 patients—	Positive by X-ray—parenchymatous infiltration Positive by fluoroscope Positive by physical examination—presence of moisture
Probable Negative	4 patients—	Suspected by X-ray—calcified tubercles Suspected by fluoroscope Negative by physical examination

BOOK REVIEWS

Manual of Psychiatry and Mental Hygiene. By AARON J. ROSANOFF, M. D. John Wiley and Sons, New York, 1938, 1091 pages. Price $7.50.

This, the seventh edition of Rosanoff's popular manual (the first edition appeared in 1905, the sixth in 1927), has been almost completely rewritten and much enlarged, thereby definitely amplfying the fine quality of its predecessors. As the author points out, this amplification became essential because of the noteworthy progress which has been made in pspchiatry during the past decade.

The author has most admirably divided the contents into six parts under the following general headings—General Psychiatry, Special Psychiatry, The Practice of Psychiatry, Mental Hygiene, Special Diagnostic Procedures and appendices.

As there are 39 chapters it would, in a review of conservative length, be obviously impossible to comment on each individual chapter, much as one might desire so to do. We shall therefore select for comment only those chapters which in our opinion have special significance.

Chapter I, although occupying only 28 pages, outlines most adequately the etiology of mental disorders. It seems almost impossible that such a broad field could be covered so completely and so well in so small a space. Undoubtedly it is Rosanoff's excellent style of writing which has achieved this comprehensive result. The author has quite definitely modified his attitude toward heredity as an etiological factor, which in his previous editions was so markedly stressed, and now gives due weight to the part which environment plays in the total situation. As is characteristic of Rosanoff, free use of statistics is made to emphasize special points under consideration.

While the second chapter discusses symptoms in the light of disturbances of psychosensory, intrapsychic and psychomotor functions, the third chapter, titled "Neuropsychiatric Syndromes, comprising nearly a hundred pages of the text, discusses the diagnostic and prognostic significance of symptoms occurring in groups such as "stupor syndromes," "delirious syndromes," "Korsakoff syndromes," et cetera. This, the reviewer feels, is an excellent method of approach and is quite helpful to the student in clarifying what heretofore has been a difficult situation in psychiatry. It, too, may be said to be especially timely as the current belief in medicine seems to be to think in terms of syndromes rather than in terms of isolated symptoms standing alone as diagnostic indicators.

Chapter V, the first in Part II, designated as Special Psychiatry, discusses classification. A new grouping has been adopted and while the official classification approved by the American Psychiatric Association in 1934 is given in Appendix I of the manual, this reviewer is not entirely in accord with the author's feeling that the modified grouping used here is advisable. Virtually every writer of textbooks of psychiatry is inclined to inject his own ideas into the matter of classification, all of which tends to confuse the student and until our knowledge is further amplified and individual theories are clarified, it is perhaps better to retain, at least for teaching purposes, the standard and official groupings. We question, therefore, whether this departure can be considered a real asset.

The discussion of hereditary factors in mental deficiency is exceedingly interesting and instructive, and points out that both autosomes and x-chromosomes seem to be involved in the transmission of traits which makes possible 54 types of mating as compared to six according to the Mendelian formulae. This changes quite perceptibly the types of expected offspring, hence complicating still further the matter of the hereditary aspects of mental deficiency. The author is to be commended for the meticulous care he has shown in the inclusion of much detail in the discussion of mental deficiency and epilepsy.

Chapter XXIII, Chaotic Sexuality Including So-called Schizophrenic Psychoses, is quite the most startling portion of the whole volume. We are heartily in accord with the author's assumption that dementia præcox or schizophrenia seems to arise on a basis of conflicts rooted in pathologic psychosexual makeup. We are also of the opinion that types of psychogenic or functional psychotic manifestations other than schizophrenia occur on a similar basis, notably the manic-depressive reactions, as well as psychoses with psychopathic personality, and that the manner in which an individual meets his psychosexual conflicts depends upon other factors, such as life experience, physical character, and so forth. We feel, therefore, that "chaotic sexuality" is not a consistently applicable term to utilize as a generic connotation of what we have heretofore been inclined to designate as dementia præcox.

When we come to the next chaper, which deals with the "so-called manic-depressive psychoses," we find that the author changes his etiological premise for classification and uses the "reaction type" as a group designator. Aside from this criticism the reviewer feels that both these important psychotic groups are well handled and excellent illustrative cases are scattered freely throughout both chapters. Cases 101 and 102, dealing with William Cowper and Julius Robert Mayer, respectively, are especially interesting and prove somewhat conclusively that "so-called manic-depressive

psychoses are not inconsistent with efficiency and achievement of the very highest order in any field of human activity, before an attack, or after it, or in intervals between attacks.''

Part III, which deals specifically with The Practice of Psychiatry, is especially complete and helpful. History taking, physical and mental examinations, and special diagnostic procedures are discussed. A chapter devoted to Therapeutic Techniques includes forcible feeding, control of excitement, prevention of suicide and even a method of artificial respiration which, to the reviewer's mind, definitely attests to the comprehensiveness and completeness of this excellent volume. The chapter on psychoanalysis, which covers 30 pages, is both clear and concise.

One might wish, in an otherwise unsually complete manual such as this appears to be, for a fuller discussion of medicolegal questions in psychiatry, and of military and industrial psychiatry than is found in Chapter XXXI, consisting of only seven pages with but one reference.

Part IV, Mental Hygiene, is particularly well done. The author's wholesome and conservative attitude of ''individualization to sterilization'' is commendable and the discussion of the mental hygiene of childhood and adolescence, 32 pages long, with a wealth of reference, is most pleasing to this reviewer. It is hoped that pediatricians will take advantage of the understanding presentation of child guidance problems here discussed.

Part V, Special Diagnostic Procedures, has a chapter each on spinal fluid examination, Wassermann reaction, examination for aphasia, Stanford-Binet intelligence scale, Kent-Rosanoff free association test, tests for alcohol and carbon monoxide and other determinations. This part occupies 146 pages. In view of the rather high price, almost prohibitive for the average medical student, necessarily set upon this book, one might be tempted to suggest the omission of this section with the hope thereby of bringing the cost to a more moderate level.

The glossary and index of subjects has been expanded from 38 pages in the sixth to 65 in the present edition and many obsolete references have been omitted. This constitutes a distinct improvement over previous editions.

Although several minor criticisms have been made of the manual they are not intended in any way to be destructive and none of the suggested defects mentioned are considered by this reviewer to be serious condemnations.

In conclusion the reviewer would state emphatically that Rosanoff has made a definite contribution in completing this excellent manual. A difficult task has been well done and the volume succeeds in giving the reader a clear orientation in a field of medicine which is much complicated not only

by diverse schools of thought but quite frequently by dissenting views among disciples of the same school. Rosanoff wisely follows the middle road and strikes a neat belance between optimism and pessimism in all controversial fields.

This book is cheerfully recommended to physicians, social workers and students.

Personality in Formation and Action. By WILLIAM HEALY, M. D. W. W. Norton and Co., Inc., New York, 1938. 197 pages, references and index. Price $2.00.

The general aim of this volume, representing the Salmon Lectures at the New York Academy of Medicine, can best be summed up in the words of Dr. Healy—"Under consideration . . . is development of strengths and symmetries of the total structure (of personality) for participation in the best types of social living." His thesis is that the field of psychiatry has broadened from "dealing with definable mental disease" to include "concern about the correction of personality ineptitudes and the maintenance of wholesome characterial tendencies." And it probably should be extended further to cover "other matters of tremendous significance for the welfare of mandkind" which "can come under the scrutiny of the psychiatrist and become the subject of research which may give some leads for raising the level of our whole social civilization."

Dr. Healy, noted for his painstaking, carefully controlled investigative contributions, proceeds to examine in the limited way permissible in the time at his disposal, the body of knowledge which has been accumulated in psychiatry and its allied fields. Giving first consideration to The Materials of Personality Formation, he surveys the known elements which enter thereinto, namely, hereditary, constitutional, physical, endocrinological, environmental and dynamic with some emphasis on a phenomenon which he calls the principle of circular response. This survey is wide, critical yet kindly and above all constructive for it points out those places in which opinions are confused, nebulous and in need of further elaborative and corroborative study.

He then turns to a description of The Developing Personality, tracing those influences which mold the individual during the more definitely formative years. Again his treatment does credit to many schools of thought, is critical but not carping nor vindictive and stresses those dim avenues on which more light could well be shed. This chapter is the longest of the four and contains the more pithy and personal remarks based on the author's three decades of experience in psychiatric thought.

It is in the final two chapters, Personality in Widening Relationships and

Implications for the Future that the most thought-compelling material is presented. Here Dr. Healy considers the part that psychiatry can play in the future development of our civilized world when it seizes the opportunity and arms itself with the necessary additional knowledge to fulfill this function.

For a balanced inclusive study of the knowledge concerning the personality and for an indication of the possibilities lying in the field of psychiatry the reading of this volume can be recommended. For those who could profit by a realization of the limits of our present knowledge and the need for further investigation, especially of the so-called normal personalities, it should be compulsory. Again in the words of Dr. Healy, "In this year of grace we have traveled only a comparatively short distance on the sea of knowledge of personality but we have gone far beyond the conception that Time, the ocean and some far-off star have entered into cabal to make us what we are."

Essentials of Psychiatry. By GEORGE W. HENRY, M. D. The Williams and Wilkins Company. Baltimore. 1938. 447 pages and bibliography. Price $5.00.

A new edition of Dr. Henry's textbook is a significant event, significant for several reasons but mainly because it is an index of the increasing attention now paid to psychiatry by students which has called for three revisions and four printings of the book in about 12 years. This observation must, to be understood, take into consideration the fact that there are also on the market several other popular texts, some of which have also gone into several editions.

It is not hard to understand the popularity of this book; it is well planned for arrangement and is readable. Henry is a typical exponent of what has of late become known as American psychiatry; a psychiatry which seeks to answer the queries, why and whither. It has little patience with the formal and static conceptions yet current in some schools of which the Kraepelinian may be taken as a paradigm. American psychiatry is dynamic and searching and in a sense eclectic; it makes use of whatever hypotheses and formulations seem to produce results in better understanding of its problems. Science has made important advances by the employment of hypotheses, even though some of them were later to be proven false. Chemical science made striking progress upon the theory that the atom was ultimate and indivisible, progress which led eventually to the modern conceptions of the composition of matters, still an hypothesis which may eventually need equally radical revision. And so American psychiatry makes use of the formulation of the Freudian school with-

out marking time until the quarrels among the reactionaries and progressives are finally compromised. Where would medicine have stood in relation to the treatment of malaria had it waited for the discovery of the parasite?

It makes use, too, of the formulations of Young and Adler; it insists upon complete study of the organic functions and a final summarization of the case in terms of familial, environmental, somatic and psychic. All this is well stated in the book under review; the case of "Bessie," a catatonic, is an excellent example of a modern case history and the other cases are cited at length to illustrate various types of reactions. The book is recommended for students of medicine and graduates and will also serve as a reference book for other social groups and libraries.

Psychotherapy. By PAUL SCHILDER, M. D., Ph.D. W. W. Norton and Company, New York. 1938. 344 pages. Price $3.50.

Schilder's aims, attitude and scope, posed in the following have been well realized in this volume. These three excerpts are from the preface:

> "This book has developed from a conviction that psychotherapy is not an art but a technical procedure based upon scientific principles. . ."
>
> "This book is intended for the student, the physician and the psychiatrist in their approach to psychotherapy. A textbook such as this might prove interesting to the psychologist, educator, or sociologist, that he may know about the physician's approach to his patients, *but not in order to do psychotherapy* . . ." (reviewer's italics).
>
> "Modern psychotherapy has to utilize psychoanalysis. . ."

After surveying general principles and psychophysiological relations, symptomatology is discussed. From a psychotherapeutic point of view a table of basic symptoms concerning body ailments, be they organic or psychogenic in etiology is presented for orientation:

1. Symptoms of the surface of the boy viz. . . .b) mutilation subtraction from the images of the body).
2. Symptoms of the openings of the boy: (a) occlusion, (b) excessive discharge.
3. Symptoms of the senses.
4. Symptoms of the inside of the body, viz., (a) increased heaviness.
5. Symptoms of motility.
6. General symptoms, ivz., (a) anxiety.

With reference to one of the above, the author gives it as his opinion that the castration fear is only one of the many expressions of the fear that the integrity of the body might be violated, although he qualifies this somewhat unorthodox view by adding that maybe "it is its foremost representative."

In such a text the chapters Symptomatology of Organic Disease, Somatic health as an Experience and Psychic Health as an Experience are particularly apt and are sound presentations. Instances cited with reference to the former include the view that nausea is the beginning of an attitude of rejection and that "dizziness is the psychological sign of a sensual or moral disorientation in the world." Relative to the primary origin of psychogenic fatigue the author states: "I have always felt that the correction of the wrong ideology concerning masculinity and feminity is an important part in every psychotherapeutic approach, and that the courage of being passive and of confessing to one's own passive side is a necessary step for a deeper adaptation." Schilder calls attention to the concept that pain, sexual excitement and anxiety are in the center of the personality as are the complexes of schizophrenia and neurosis. Similarly operations on parts of the body nearer to the center of the ego, viz., genitals, breasts, eyes, provoke more postoperative psychoses than do nonmutilating operations. In contrast, "The experiences of organic brain lesions . . . concern material which is rather impersonal."

In discussing orientation toward "inner conflict" the writer points out that "we are always directed towards real objects and real situations, even in our phantasy life and in our daydreaming." Schilder summarizes the danger situations for the child, as deprivation of love, food and support and encroachment on the body integrity; for the adult, as loss of money, position, prestige, love objects and body integrity, and disease. In the face of these, the individual who gives up the process of trial and error and goes back to a narrower world may be called neurotic, psychopathic or psychotic.

A chapter entitled Technical Tools of Psychotherapy considers discussion, advice, persuasion, appeal to will power, discussion of the past, cathartic hypnosis, hypnosis to resolve amnesia, hypnotic repetition of the traumatic scene, free association, play technique, associations to pictures and puppet shows, and opinions of children. Dream interpretation, interpretation of daydreams, interpretation of every-day-life mistakes, interpretation of first memories, analysis of ideologies, analysis of social adaptation, activity, hypnosis as a technique of suggestion, suggestion, relaxation and concentration, changing the surroundings, hospital and occupational therapy,

organization of a children's ward and group treatment complete this long list.

Free association, in the author's opinion has become the most important technical help in modern psychotherapy, and he stresses that in practice it is a directed process. Another point of view is expressed in the following: "Furthermore, I do not think that the so-called unconscious is out of the field of awareness. It is merely a different type of awareness and is endowed with the particular characteristics of thinking as shown above." Also, symbols express two conflicting tendencies and appear on the crossroads of two drives. In this connection Schilder questions Jung's postulate of the archetypes of the so-called collective unconscious. With reference to every-day psychopathology he urges that one consider the sign function of mistakes, misfortunes and accidents. The sections dealing with the analysis of ideologies and of social adaptation are excellent—the former is too often neglected in treatment. Hypnosis, with which the author has obviously had considerable experience, is well presented in its various uses. The common and very bad practice of the physician high-handedly manipulating the patient's milieu is strongly interdicted.

Positive, negative and counter transference and resistance are considered in the chapter dealing with the relation between physician and patient. The handling of these relationships by adherents of Freud, Adler, Jung and Meyer receive critical appraisal. Two conclusions may be cited: "He (the psychotherapist) may answer the hostility of the patient with counter-aggression, which will come out in the way he interprets. Overrating the patient's need for his help and wanting to keep the patient dependent upon him, he will prolong the analysis unnecessarily. Accustomed to play the superior role, he may overrate himself considerably. He is, furthermore, under particular stress, in so far as he refrains from expressing any of his emotions to the patient . . . The psychotherapeutic situation, especially in analysis, is not satisfactory from a human point of view.

"The physician who by the particular method he chooses is able to express himself more freely is psychologically in a better situation. But he is in some danger of overrating his ideologies, of coming forward too much with his own opinions, and of impressing on the patient a style of life for which the patient is not fit. It is the important task of the physician to develop the patient's personality according to the capacities, endowments, and characteristics of the patient." With reference to religion Schilder states unequivocally that the great religious systems as well as even strict moral systems, if rightly understood, leave room for an adaptation to reality which should be sufficient for anyone. Decisions in this respect should be left for the patient after he has gained insight.

The author has the following to say to the young psychiatrist after discussing the merits of didactic analysis: "It cannot substitute for clinical experience, study, and respect for other human beings. Since Freud himself has not been analyzed and since many of his followers who have contributed largely to the progress of analysis, and as I have convinced myself are competent analysts, have not been analyzed, I cannot consider his own analysis as an indispensable requisite for the psychotherapeutist or even the analyst. I have not myself been analyzed. The danger of the analysis of the therepeutist lies in the possibility that he may become too much imbued with the principles and the technique of the man who analyses him . . . At any rate, a didactic analysis does not protect the therapeutist from being led astray by his own emotional needs and prejudices. For one 'blind spot' in human problems it may substitute other ones." Out of the context of the book which makes continuous use of psychoanalytic principles this seems rankly heretical.

In the longest chapter, The Psychotherapeutic Systems, the methodology of psychoanalysis, individual psychology, Jungian analysis, psychobiology, short psychotherapy and group psychotherapy are discussed in some detail. The observation that the important part in Adler's system is his interest in reality and especially in social reality is a well taken one. Schilder disparages the practical employment of Jung's word-association test, and feels that the adaptation reached by psychobiology is more or less superficial and limited in application to the psychotic.

The method, difficulties and variations from the formal procedure of short psychotherapy are given at some length. The author combines hypnosis with this therapy. A practical suggestion is contained in the following: "I have never seen anything good come from lengthening a single session over an hour."

In view of the current interest in the subject it is appropriate that Schilder devotes considerable space to group psychotherapy, which he has used at Bellevue. Briefly the procedure consists in preliminary individual interviews for orientation, the report of the life history and instruction in free association and dream analysis. After some insight is reached a written detailed biography is requested. Thereafter the patient is seen with a group of about six persons of the same sex in various stages of analysis, once weekly, for longer sessions. He is also seen individually twice weekly. At the group sessions any patient with sufficient insight may interpret or add associations and experiences of his own. Analysis of ideologies plays an important part in the discussions, the individual sees the fundamental identity of his problems with those of the others and, it is noted, the phe-

nomena of positive and negative transference were equally marked in the group as in the usual analysis.

A series of questionnaires, not to be placed in the hands of the patient, but for the guidance of the physician conducting this therapy is reproduced with comments. Certain of these latter bear quotation: "Everyone should be aware of the necessity of having shortcomings. The ideal of general efficiency and striving to be blameless are wrong . . . In repressed families, modesty concerning sex and excretion is preached with the same religious fervor . . . Parents have to pay dearly for every perfectionistic ideal they put into their children's minds. The child will soon measure his parents against the ideals implanted in him, and find them wanting . . . The struggle for superiority in friendships is very outspoken . . . One points to the so-called successful practitioner who plays the role of the good uncle and thus cures his patients. I think one should keep in mind that . . . the psychotherapeutist will fail if his psychotherapy is based upon the display of what one calls personality."

The patient comes for treatment as long as he feels that he is not completely adapted to his situation. Schilder claims that the results with social, obsessional and anxiety neuroses were very good; with cases of depersonalization, character problems and hysteria there were some cures. No results were obtained with manic-depressive depressions. He believes that one case of schizophrenia was cured and others influenced favorably. Incidentally in stammering, group psychotherapy is considered the method of choice.

The final chapter concerns itself with the treatment of specific disorders. Included are neuroses, psychopathic personality, addiction, frigidity and impotence, manic-depressive disorders, suicide, schizophrenia, epilepsy, organic disorders, and childhood neuroses and behavior problems. Schilder employs his own classification of neuroses and begins by restating his opinion that the Freudian theory of actual neurosis is incorrect. He substitutes a group where the neurosis "serves almost completely the present conflict." In this, says the author, the infantile conflict is not of paramount importance, citing the war neurosis as a preliminary example. With reference to organic disease he advocates a modest psychotherapeutic approach, "although the psychotherapeutic attitude should prevail."

Little new is said concerning the treatment of psychopathic personalities. However Schilder believes they react well to group therapy and that special attention should be given to resistance coming from the character. Without definite local pathology the author considers that urological local treatment in impotency is senseless and often harmful, and further that "or-

ganic impotencies'' in diabetes and tabes are ''very often dependent in their final expression on psychological factors.''

Schilder counters the universal opinion that psychoanalysis is harmful to the schizophrenic by pointing out that such can be no more dangerous than analysis of the non-schizophrenic, holding the technique at fault for bad results. He is outspoken in terming Melanie Klein's technique in child analysis violent and arbitrary. An important hint to those dealing with children is contained in the following: ''It is probable that the majority of conversion symptoms take their origin from actual diseases experienced in childhood . . . An enema is not only a physical treatment but an important psychological event in a child's life.''

This reviewer is unable to allow the following statement to pass unchallenged: ''There are such distinct hereditary relations that we have the right to consider the manic-depressive psychosis as an organic constitutional disease . . .'' Granted that this disorder is classified as a constitutional one, the hereditary background has not been demonstrated with any degree of finality.

This volume is an admirable presentation of present-day psychotherapy and raises a number of problems for future investigation. Some will disagree with Schilder along doctrinal lines, others will be annoyed by his style and arrangement of material at a few points, but most will read the work with profitable enjoyment. Much of his material and his psychotherapeutic attitude could well be incorporated into the teaching of general therapeutics.

A bibliography and an index are appended.

Modern Society and Mental Disease. By CARNEY LANDIS, Ph.D., and JAMES D. PAGE, Ph.D. Farrar and Rinehart, Inc., New York, 1938. 190 pages, with index. Price $1.50.

The bulk of the material in this little book is well known to the informed psychiatrist. The reviewer assumes, then, that the authors address the general literate population, or perhaps professional men and women, such as educators, social workers, and lawyers, whose interests frequently border on the social problems involved in mental disorder. For such readers, fact and theory should be furnished with a high degree of compactness. In this, the writers have succeeded admirably; they have provided an excellent handbook wherein one finds an informative collection of statistical reports from far and near.

Insofar as it remains a handbook, Society and Mental Disease can claim reliability. But where interpretation is attempted, grievous errors are encountered from time to time. Frequently the authors speak emphatically,

conclusively, on issues that are yet controversial, and some of their conclusions are in no sense tenable. This, then, is not enlightenment; it is miseducation. Allowance is made for the possibility that the authors did not wish to embroil their readers in philosophical impasses, and for the laudable aim of packing solid information within a small compass. Neither of these purposes, however, can excuse the misstatement that the alcoholic psychoses are due to excessive intoxication; nor the flat refutation (in a few lines, with but one reference) of the theory that the neuroses and the psychoses may differ merely in degree; nor the adulation of figures that prove nothing, in an attempt to arrive at some definite reply—any reply, even the wrong one—to the question of an hereditary basis for the psychoses. Above all, the following monumental dogmaa, stated in so positive a manner, gives the reviewer the impression that Landis and Page labor hard to give final answers to questions which every trained psychiatrist knows must await the test of further time:

> Our data all favor the argument that the basic etiological factors of "mental" (their quotes) disease are physiological and constitutional rather than psychological. If the basic factors were psychological, then we should find the highest rates of incidence either in those times of greatest social stress, such as war, disaster, or great social insecurity, or particularly at those age periods in the life of the individual when stress of personal adjustment is the greatest.

Do they really believe this? Such misplaced reliance upon age tables is appalling. What has the age of the patient on admission to do with the "basic etiological factors" of his psychiatric disorder? Must we expect that psychological factors, such as an unadjusted Oedipus situation, will rise and smite the individual at once? Then most of our patients would be admitted at a very tender age. On the contrary, psychological factors are often slow moving in their destruction of the personality. The mother-fixated individual does not succumb to his inadequacy until adulthood becomes too great a burden for him. The escape via alcohol is a response to something; but certainly not a response to alcoholic intoxication. Landis and Page apparently wish to correlate age at admission with a specific time at which psychological factors begin their work, but they are far afield in adopting such a vantage point.

The treatment of the subheading, (page 81) Are Mental Diseases Inherited? is only moderately good. The following excerpt was probably not intended to be misleading, but so it will be to the average reader:

> When we consider the nature and etiology of the various mental diseases, we become aware of the fact that in less than 40 per cent of the patients admitted to mental hospitals do we find the evidence for a hereditary basis . . .

Less than 40 per cent indeed! Is this as low as they felt they could put the figure? Certainly the authors must be acquainted with the work of Jennings, whose Biological Basis of Human Nature commands respectful attention: "Characteristics are not inherited at all; what one inherits is certain material that under certain conditions will produce a particular characteristic; if these conditions are not supplied, some other characteristic is produced." It is all very well to calculate the "expectancy" for dementia præcox upon rates of admission of schizophrenics and their children and other relatives. But where is the allowance that has to be made for the purely environmental heritage of the child of parents (or one parent) of schizoid makeup? In such arbitrary statistical reasoning is cognizance taken of the early conditioning that sows the seeds for later psychosis?

To say that the World War, depression, changing standards of living have brought no relative increase in mental disease, is a far cry from demonstrating that psychological factors are insignificant in the etiology of mental diseases. Social patterns may change, but various combinations of the same psychological factors are at work at any time, in any form of society. May we say that the tenor of life was so uneventful a few centuries ago that people were relatively free from mental disorer? Time trends are not available to prove this. The citation of social fluctuations within little more than a generation is feeble argument indeed.

Landis and Page have brought between the covers of this book a curious combination of useful information and dogmatic positiveness. For the former, it is recommended; for the latter, caautious reading and only tentative acceptance of the conclusions are suggested. Meanwhile, let us look for a revision of the work, with more open-mindedness and less worship of percentages.

Dream Analysis. A Practical Handbook in Psychoanalysis. By Ella Freeman Sharpe. New York. W. W. Norton and Co. 1938. Cloth. 211 pages. Price $2.50.

Miss Sharpe is a member of the Training Committee of the London Institute of Psychoanalysis. The chairman of this committee is Dr. Ernest Jones, the dean of psychoanalysts in Great Britain and regarded by some as the logical successor to Freud. Miss Sharpe has just claims to authen-

ticity. They are confirmed by the perusal of this monograph which reflects the current viewpoints of the orthodox Freudians.

Based as the work is upon lectures given to students in training, the technical steps to be taken for the interpretation of the dream are discussed in detail with practical comments and explanations. For illustration fragments or larger portions of actual dreams are made use of with good effect. The student cannot fail to obtain benefit from a careful reading but the book should be taken up as a supplement to the *Traumdeutung*, that classic which will never be superseded. The book is recommended as one of the best to be had upon the subject of dream interpretation.

Sex Satisfaction and Happy Marriage. By the Reverend Alfred Henry Tyrer. Emerson Books, Inc., New York. 1938. 158 pages. Price $2.00.

This is a sincere book on the subject of marital adjustment, directed to the lay person. Its chief virtue lies in the fact that it is written by a clergyman who speaks from 40 years experience in his profession and some eight as "marriage counsellor." With this authority he hopes to modify the attitude of sexual repression found most frequently in those reared in "the atmosphere of church homes." Such modification can be anticipated in those not psychosexually immature (largely from the same forces, to be sure) and perhaps in the children of those parents who may adopt the author's attitude. His central thesis is that marital love is God-given, that as such it is to be enjoyed to the full, and that wrong ideologies, inhibitions and ignorance prevail. Tyrer differs from some ecclesiastical opinion in this pronouncement: ". . . There is absolutely no virture in virginity that may not be present in the most ecstatic moment of of the sexual embrace in marriage."

The material is sound for the most part, and has been checked by physicians, a psychologist, endocrinologist, attorneys, et cetera. The scope and depth are indicated by some chapter headings: Female Sex Organs, Where Babies Come From, Dangers of Abortion, Personal Hygiene, The Love-Play, The First Night, The Frigid Wife, Concerning Many Things, et cetera.

As do some others, he favors contraception for the relief of marital situations complicated by various factors after realistically citing its widespread employment, and advocates it to facilitate early marriage. The substitution of the term self-relief for self-abuse has therapeutic connotations but the reviewer is uncertain concerning some advice given on the subject. The advocacy of premarital stretching of the hymen by the woman herself is not to be preferred to surgical measures. Psychiatrists could not suppress

at least grim laughter at the naise assumption that ". . . Nature lures the feet of the young into the pathway that leads to monogamous marriage." Likewise they might wonder at the author's apparent fixations relative to cleanliness and bright nail polish! Many women can refute from personal experience his statement that there is no erotic rhythm. The following paragraph is worthy of reproduction particularly in view of its source: "Prostitution with its menace of unhappy homes and devastating diseases has blighted civilization too long, but it will never die out until the spontaneity and the abandon, the unrepressed desires of the body, the love of bodily exposure, the joyous and sensuous love-play, all of which have characterized the outsider's stock in trade, have been transferred to the home where they legitimately belong, and where they can serve only to bind husband and wife more closely together."

The index consists of few pages; it follows a section devoted to frequently-asked questions and their answers.

The reviewer wishes again to stress the author's sincerity. Whether he overcompensates in his mental hygiene approach will be a question to some readers. A usually good style is broken at times by awkwardness, the use of "dated" expressions, and the impression that one is being preached to. There are as well certain irrelevancies.

This passage expresses the Reverend Tyrer's purpose and self-imposed limitations: ". . . This book does not pretend to lay down any cut-and-dried rules for the guidance of lovers . . . Love must be spontaneous or it loses its romance. But the accumulated wisdom recorded in the many volumes about love that the ages have produced can at least warn us of things that should not be done, and make suggestions that may stimulate a backward imagination and so encourage spontaneity by indicating possibilities."

NOTES

—The afternoon of November 17, at the Twentieth Century Club in Boston, the Massachusetts Society for Mental Hygiene held its annual meeting, which was preceded by a luncheon. Dr. W. Carson Ryan, Jr., president of the Progressive Education Association, addressed the gathering on the subject "An Educator Looks at Mental Hygiene."

—The sixty-eighth annual meeting of the American Public Health Association will be held in Pittsburgh, Pa., October 17-20, 1939, with headquarters at the William Penn Hotel. Dr. Reginald M. Atwater, executive secretary, has announced that the chairman of the local committee will be Dr. I. Hope Alexander, director of health of the city of Pittsburgh.

—The Woods Schools, at Langhorne, Pa., offered their fifth institute on the exceptional child, during the morning and afternoon of October 18. This year's general title was "Modern Science and the Exceptional Child." Addresses were given by Dr. Lawson G. Lowrey, director of mental hygiene research of the Vocational Adjustment Bureau and editor of the American Journal of Orthopsychiatry, New York, and by Dr. Edgar A. Doll, director of research, The Training School, Vineland, N. J.

—The New York Psychoanalytic Society met on the evening of November 29, at the New York Psychoanalytic Institute, 324 West 86th Street. The scientific session was devoted to the reading of a paper by Dr. Franz Cohn, on "Practical Approaches to the Problem of Narcissistic Neuroses." At the executive session vote was taken on some amendments to the constitution and by-laws. Officers of the society include: Bertram D. Lewin, M. D., president; George E. Daniels, M. D., Secretary; Monroe Meyer, executive director.

—A course in the application of the Rorschach method will be offered by Dr. S. J. Beck, at Michael Reese Hospital, Chicago, May 15-20, 1939, which is the week following the annual convention of the American Psychiatric Association. Tentative plans are also being made for a similar course, of 10 days, to be given later in the summer. For information, write to the Librarian, Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago, Ill.

—Announcement is made of the coming meeting of the American Orthopsychiatric Association, to be held February 23-25, 1939, at the Hotel Commodore, Lexington Avenue and 42nd Street, New York City. This will

mark the sixteenth annual meeting of this organization for the study and treatment of behavior and its disorders, of which Frank J. O'Brien, M. D., New York, is president. Its publication, the American Journal of Orthopsychiatry, widely read, is edited by Lawson G. Lowrey, M. D. Details can be obtained from Dr. Norvelle C. Lamar, Secretary, 149, East 73rd Street, New York, N. Y.

—Dr. Richard H. Hutchings, Jr., first assistant physician at Harlem Valley State Hospital, died suddenly on December 14, 1938, of cardiac thrombosis. He entered the service in 1920 and was stationed at Marcy for several years. Later he served as deputy medical inspector for three years and was promoted to first assistant grade in 1930.

Dr. Hutchings was recognized as an authority on physical therapy and roentgenology, being frequently consulted in preparation of plans for such laboratories. He was a fluent speaker on mental hygiene topics and had keen interest in music. At the time of his death he had been for several years president of the reserve officers' organization of Dutchess County.

—The Philadelphia County Medical Society has made formal announcement of the completion of its scientific program for the Fourth Annual Postgraduate Institute, to be held in the Bellevue-Stratford Hotel, Philadelphia, during the week beginning March 13, 1939. The subjects to be considered are those embraced by the terms Blood Dyscrasias and Metabolic Disorders. These will be further subdivided for convenience in instruction into 86 clinical lectures, with open forum discussion for each topic, delivered by as many individual specialists of national distinction. Address all inquiries to The Philadelphia County Medical Society, Twenty-first and Spruce Streets, Philadelphia, Pa.

—The Mississippi Valley Medical Society offers a cash prize of $100, a gold medal and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be members of the American Medical Association. All contributions must not exceed five thousand words, must be typewritten in English in manuscript form, submitted in five copies, and must be received not later than May 1, 1939. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Burlington, Iowa, September 27-29, 1939. Further details may be secured from Harold Swanberg, M. D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Ill.

—The third international neurological congress will take place in Copenhagen, Denmark, August 21 to 25, 1939. The sessions of the congress will

be held in the House of Parliament in Copenhagen. The program executive committee has chosen the following for the subjects of the three symposia to be presented:

1. The Autonomic Nervous System with Special Reference to the Endocrine System.
2. Heredo-Familial Disease, Especially from the Genetic Aspect.
3. Neurological Aspects of the Avitaminoses, with Special Reference to the Peripheral System.

Membership in the congress will comprise both active and associated members. Applications, and complete details concerning the membership, may be obtained by writing to Dr. Henry Alsop Riley, secretary of the American Neurological Association, 117 East 72nd Street, New York, N. Y.

—Evidence of increased attention to public education in personality development are the university extension courses offered by the Massachusetts Department of Education. A general course, Keeping Mentally Fit—Mental Hygiene for Adults, opened with a lecture by Arthur H. Ruggles, November 3 and closed with a lecture by Dr. Donald Greff, president of the Massachusetts Society for Mental Hygiene, January 12. The course comprised eight lectures in all, and was well attended. Other, more specific courses, which could be taken for collegiate credit, included practical psychology in everyday life, business and industrial psychology, child psychology. The general course was given at Gardner Auditorium, State House, Boston. The specialized courses were held at Old South Meeting House and at the Massachusetts Institute of Technology or Harvard University. Information concerning future courses of this nature may be had by writing to James A. Moyer, Director, Division of University Extension, 217 State House, Boston, Mass.

—Word has been received that Aaron J. Rosanoff, M. D., has been appointed director of institutions of the state of California. This appointment, similar to that of commissioner of mental hygiene in New York State, constituted one of the earliest official acts of the Hon. Culbert L. Olson, as governor-elect of California.

Dr. Rosanoff completed his medical training at Cornell University Medical School in 1900. The following year he entered the service of New York State at Kings Park State Hospital, where he rose to the position of first assistant physician. He left in 1922, to enter private practice at Los Angeles, becoming medical director of the Alhambra Sanatorium. Dr. Rosanoff is the author of many books and periodical articles, his most recent work being "The Etiology of Mental Deficiency, with Especial Reference to Twins," which is reviewed in this issue. During the World War

he served as captain in the medical corps, later receiving the rank of major; he was chief of the neuropsychiatric service of the O. R. C. from 1919 to 1930.

The PSYCHIATRIC QUARTERLY rejoices in this highly gratifying and commendable act on the part of California's incoming executive, and looks with pride upon the bestowal of so signal an honor upon a former New York State psychiatrist.